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GLOBAL MARKET SURVEY

FOOD PROCESSING AND PACKAGING EQUIPMENT

U.S. DEPARTMENT OF COMMERCE/Domestic and International Business Administration

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GLOBAL MARKET SURVEY

FOOD PROCESSING AND PACKAGING EQUIPMENT

PENNSYLVANIA STATE UNIVERSITY
SEP 8 1975
DOCUMENTS COLLECTION

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U. S. Depository Copy

AUGUST 1975

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
Price $2.30

Preface

This Global Market Survey is intended to serve as an export sales planning tool for marketing decision makers of American companies engaged in the manufacture of food processing and packaging equipment. It is a ready desk reference of facts and figures on the country markets researched and identifies the best U.S. export sales opportunities in each market on a product-by-product basis.

This Survey is one in a series of Bureau of International Commerce publications focusing on foreign marketing opportunities for U.S. suppliers in selected industries. The Surveys are prepared by the Bureau's Office of International Marketing in cooperation with the U.S. Foreign Service—Department of State. They are based on research conducted either by overseas contractors under U.S. Foreign Service supervision or by the economic/commercial officers of the Foreign Service.

U.S. products and industries featured in Global Market Surveys are selected because of their technological or other competitive advantages in the world marketplace. Previously published Global Market Surveys are:

Agricultural Machinery and Equipment (1973)
Micrographics Equipment and Supplies (1973)
Biomedical Equipment (1973)
Computers and Related Equipment (1973)
Materials Handling Equipment (1974)
Electronics Industry Production and Test Equipment (1974)
Printing and Graphic Arts Equipment (1974)
Electronic Components (1974)
Metalworking and Finishing Equipment (1975)
Avionics and Aviation Support Equipment (1975)
Process Control Instrumentation (1975)

For additional information on any of the above Global Market Surveys or any of the U.S. Department of Commerce export expansion programs and services, contact the Department's district office nearest you (list on page 144).

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The Global Marketing Program

U.S. exports reached a record $98 billion in 1974, or 40% above the 1973 level. Export business is profitable and opportunities abound as growth of foreign markets often exceeds that in the United States. Exports can increase company production, often with only minimal addition to overhead. Exports can contribute to business stability and counter domestic seasonal and cyclical fluctuations both in production and sales.

The Global Marketing Program, aimed at worldwide market penetration, involves medium to long-term action by the Government in concert with 15 U.S. industrial sectors that are in a particularly advantageous position to increase export sales.

Through this Program, a wide range of U.S. Government services focuses on developing and expanding individual company sales in the foreign marketplace.

The Bureau of International Commerce's *Office of International Marketing (OIM)* is responsible for developing an effective foreign trade promotion program related to U.S. industry's needs. Other action units within the Domestic and International Business Administration (DIBA) include: the *Bureau of East-West Trade* and the *Commerce Action Group for the Near East,* concentrating special expertise and business services on the exceptional trading opportunities in these areas; the *Office of Export Development,* providing vital data on export opportunities and on potential overseas customers; and the *Office of Field Operations,* delivering all of these services to the doorstep of the American businessman through 43 District Offices.

15 Priority Industries

Fifteen American industries have been selected for inclusion in the Global Marketing Program. The selections were based on an assessment of their competitive advantages and growth potential in the world marketplace. The Office of International Marketing solicits information and assistance from each key U.S. industry and related trade associations in planning the industry programs, in developing market research requirements, and in selecting the country markets to be researched.

A Global Marketing Program combining the services outlined below is scheduled for each industry on a 3-year cycle.

- Foreign market research, conducted in 20-25 countries under the supervision of OIM and the U.S. Foreign Service—Department of State, is made available to U.S. firms in the selected industry.
- A Global Market Survey, based on the above research, is prepared and published by OIM specifically for the selected industry.
- Commerce district office account executives provide Global Market Surveys to firms in the industry and work with them in the preparation and implementation of individual company export marketing plans.
- Country Marketing Managers assist American companies in increasing their export business in specific countries and regions of the world by providing current marketing information and by working with individual companies in promoting their products.
- Commerce-sponsored overseas sales promotion events are programmed over a 2-year period during each industry's 3-year cycle. Events include U.S. Trade Center Exhibitions, Trade Fairs, Technical Sales Seminars, Trade Missions, and Catalog Shows planned and implemented by the Office of International Marketing, the Office of East-West Trade Development and the Commerce Action Group for the Near East.

Further Information

To make effective use of these and other services contact your nearest Commerce district office (see list on page 144).

Global Marketing Program Industries 1975-77

Metalworking and Finishing Equipment
Avionics and Aviation Support Equipment
Process Control Instrumentation
Food Processing and Packaging Equipment
Air and Water Purification and Pollution Control Equipment
Laboratory Instruments
Business Equipment and Systems
Electric Energy Systems
Communications Equipment
Building Materials and Equipment
Computers and Related Equipment
Health Care Industries Equipment
Electronic Industry Production and Test Equipment
Printing and Graphic Arts Equipment
Electronic Components

Major Foreign Markets for Food Processing and Packaging Equipment—An Overview

Exports are playing an increasingly vital role in the U.S. food processing and packaging equipment industry. While total product shipments grew at an average rate of 8.8% annually during the seven years from 1967 through 1974, the industry's exports rose much more rapidly—at a 13.7% rate. In 1974 they were valued at more than $360 million,[1] or approximately 30% of all industry product shipments. These figures are a strong indication that increasing numbers of the industry's members are finding participation in the international marketplace quite profitable.

This Global Market Survey is based on research conducted for the Office of International Marketing in 16 major foreign markets. It attests to highly lucrative export sales opportunities for American manufacturers of food processing and packaging equipment in the years just ahead. Projections drawn from the research indicate that U.S. sales to these 16 countries will exceed $350 million in 1978, up from $222 million in 1974. The major markets for U.S.-made equipment at this time are Canada, Venezuela, the United Kingdom, Mexico, and Japan (see figure 1). The U.S.S.R. has considerable potential for becoming another leading market during the next few years.

Growth Markets

Total sales of food processing and packaging equipment in the surveyed countries are forecast to climb from $3.9 billion in 1974 to $5.8 billion in 1978—an increase of 50% (see figure 2 and table 1). Markets expected to experience the greatest growth include Iran, where sales are forecast to rise at an average annual rate of well over 40% during the next 4 years, and the U.S.S.R., Italy, and Brazil, each with annual market growth projected at 15% or more. The U.S.S.R. and Italy, along with Japan, Germany, and France—all major producers of

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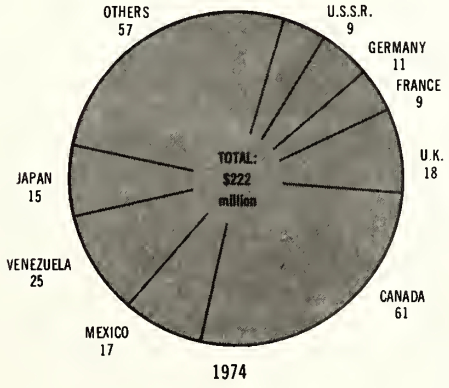
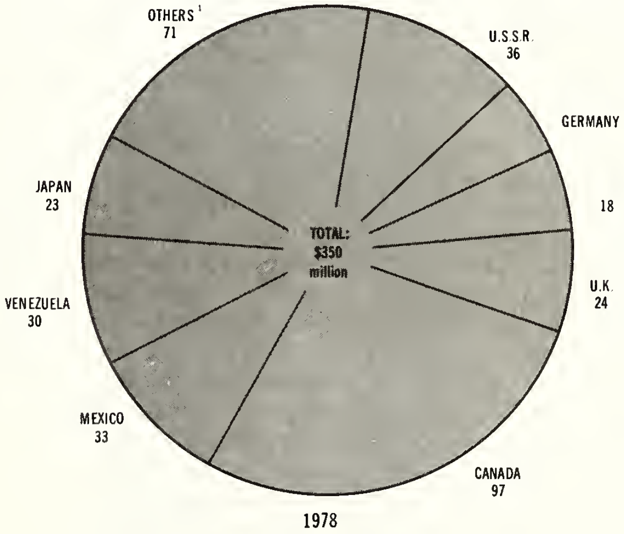
[1] Food products machinery classified under SIC code 3551 only. See box on page 2 for product category definition of equipment covered in this Survey.

Figure 1.–Surveyed countries' imports of food processing and packaging equipment from the U.S., 1974 and 1978

(in millions of U.S. dollars)





OTHERS

	1974	1978		1974	1978
AUSTRALIA	11	15	ITALY	3	4
BRAZIL	9	17	NETHERLANDS	13	n.a.
IRAN	2	12	SPAIN	4	5
ISRAEL	2	3	SWEDEN	13	15

[1] Excludes the Netherlands

Source: Bureau of International Commerce, Office of International Marketing research reports

The Product Category—Food Processing and Packaging Equipment

The product category comprises that machinery, apparatus, instrumentation, and accessories which are directly employed in the preparation, processing, and packaging of food and beverage products. Food processing and packaging equipment is classified by the two international foreign trade statistical classification systems, SITC (Standard Industrial Trade Classification) and BTN (Brussels Tariff Nomenclature), and the SIC (Standard Industrial Classification) under the following codes:

Product Description	SITC	BTN	SIC (1972)
The following classifications include only food processing equipment			
Cream separators	712.31	84.18A	3551
Other dairy machinery	712.39	84.26	3551
Presses for wine-making, etc.	712.91	84.27	3551
Machinery for milling grain	718.31	84.29	3551
Other food processing machines	718.39	84.30	3551
The following classifications include non-food as well as food processing equipment			
Industrial and laboratory furnaces and ovens, nonelectric	719.14	84.14	3567
Electric furnaces; electric welding and cutting apparatus	729.92	85.11	3567
Refrigerating equipment	719.15	84.15A	3585
Other apparatus for treating materials with heat or cold	719.19	84.17A	3443
Pumps for liquids	719.21	84.10	3561
Centrifuges; filtering, purifying machinery for liquids and gases	719.23	84.18B	3569
Machinery and mechanical appliances, n.e.s.	719.80	84.59B	3551
Instruments for measuring or controlling the flow, depth, pressure, etc., of liquids or gases	861.97	90.24	3823 3824
Other electrical measuring and controlling instruments and apparatus	729.52	90.28	3823 3824
The following classifications include non-food as well as food packaging equipment			
Machines for cleaning or filling bottles or other containers; machines for canning, wrapping, packaging, sealing, labeling, etc.	719.62	84.19	3551
Weighing machinery	719.63	84.20	3576
Lifting and loading machinery	719.31	84.22	3535

processed foods (see table 2)—also are among the largest markets.

Developments that point to rapidly expanding equipment sales in these countries include:

- *Iran.* The Iranian Government is actively encouraging expansion of the country's food processing industry through direct investments in public enterprises and through financial assistance to private investors. Iran's Fifth Development Plan (1973-1978) places high priorities on the promotion of agriculture and agriculturally based industries. Increased meat and poultry production and a substantial expansion of dairy production are national goals; the promotion of fruit and vegetable processing is also given special emphasis. The Fifth Plan calls for expenditures of $3.6 billion in the agricultural sector and $5.2 billion in the manufacturing sector; a significant portion of the latter is expected to be channeled to the food processing industry.
- *Italy.* Italian food producers have been importing large amounts of food products, partly to avoid price controls and partly to satisfy the demand for new types of edibles and more meat. The Government has reacted to this with plans for upgrading the food industry during at least the next 5 years, with the aim of providing a greater share of the country's food needs. Consolidation, which reduced the number of food processing plants by 2,500 between 1961 and 1971, will be speeded up. Future Government expenditures probably will be directed to the meat, seafood, and fruit and vegetable production sectors, and to the food distribution system.
- *Brazil.* This country, with one of the world's fastest growing economies and with a population half the size of that in the United States, is experiencing very strong growth in its food processing industry. Trade sources project that industry sales will rise by more than 16% per year from an estimated $7.4 billion in 1974 to $13.6 billion in 1978. Fruit and vegetable

processing is expected to rise most rapidly, followed by production of meat, beverages, dairy products, and bakery products. Expansion of export sales will be a strong stimulus to meat and fruit and vegetable output.

- *U.S.S.R.* The current Soviet Five Year Plan (1971-1975) allocates a total of $13.4 billion for investment to expand and modernize food processing facilities; this is over 50% more than the sum provided under the preceding plan. High expenditure levels, for completing current projects and sustaining future development objectives, are expected to continue.
- *Japan.* The Japanese food processing industry, among the largest in the world, also is expanding at a substantial rate. Consolidation is a major force shaping the industry at the present time—some of the country's leading conglomerates are acquiring control of major food processing and retailing firms and grouping these enterprises into food products manufacturing/retailing consortia. The ultimate objective of such groups is a vertical integration of processing and retailing operations, using imported agricultural products.

Food Industry Trends

Two principal trends observed in food industries worldwide tend to favor the growth of U.S. exports of food processing and packaging equipment and systems in the years ahead. The first is the rising output of convenience foods in response to growing consumer demand. Increasing industrialization and urbanization in many countries inevitably will continue, and will result in accelerated demand for greater quantities and varieties of convenience foods. This should provide exceptional sales opportunities for American firms who are world leaders in technology for the production of ready-to-eat and frozen foods.

The second trend, increasing numbers of large, modern processing plants in foreign food industries, spells particularly good export potential for the high-speed, high-capacity processing and packaging equipment generally made by American industry. Rising production costs, brought on by escalating wage rates and higher energy and raw materials costs, are faced by food processors the world over. There is a strong movement in even the smallest countries toward greater rationalization of production, with replacement of small, inefficient plants by large establishments that can achieve economies of scale.

American-made equipment in highest demand in the world market includes:

- Highly specialized, single-purpose processing machinery
- Continuous process systems
- Quickfreezing equipment
- Precision filling, dosing, weighing and packaging machinery
- Heavy duty, high-speed packaging machinery
- Process and quality control instruments

U.S. technology employed in the making of this equipment is cited time and again by foreign users as being of the highest level available. With the number of users increasing worldwide as a result of the effects of the abovementioned trends, U.S. equipment sales should rise accordingly.

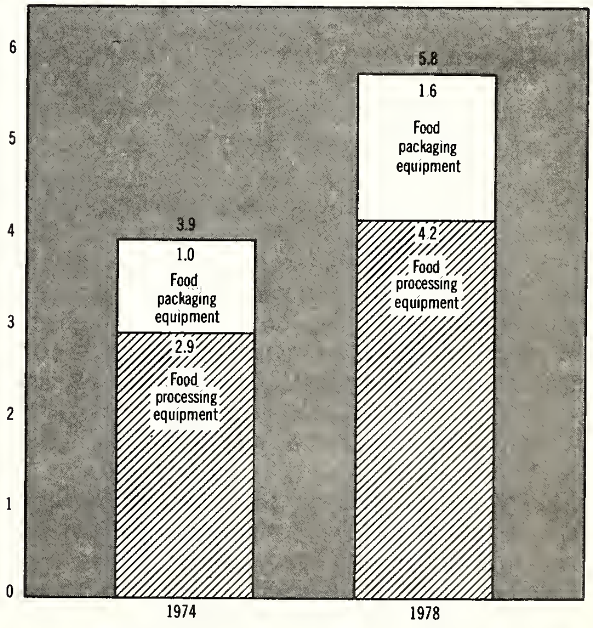
The following synopses, by major sectors of the food processing industry, provide an indication of the directions in which foreign processors are moving and what may be expected in the way of a customer base for American producers of food processing and packaging equipment.

Meat processing.—Important changes are taking place worldwide in meat preparation, packaging, and distribution. Functions once performed by independent butcher shops are increasingly being assumed by large-scale, centralized processing plants. This trend, especially pronounced in the more developed countries such as Canada and Germany, is creating strong demand for automatic, high-capacity slaughtering, processing, and packaging equipment.

Additional factors shaping equipment needs abroad include rising consumer demand for precooked meat-based dishes, increasingly stringent government regulations regarding sanitary standards and waste disposal, greater emphasis on maximum

Figure 2.–The market for food processing and packaging equipment in 16 surveyed countries, 1974 and 1978

(in billions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research reports.

utilization of the animal, and growing usage of protein additives in processed meat products.

Prospects for a soaring worldwide demand for beef into the next decade are expected to stimulate output in major cattle producing nations such as Canada, Australia, and Brazil, leading to rising requirements for automatic processing and packaging equipment in these countries. Germany also represents an excellent market for fully mechanized equipment; consumption of meat is rising rapidly there, and an unusually large proportion of consumption is in the form of processed products such as sausages and luncheon meats.

Dairy products manufacturing.—Consolidation is advancing steadily in foreign dairy industries. Smaller plants are being replaced by large, centrally located facilities capable of efficiently producing a wider range of dairy products for a greater number of people. Cooperatives and multinational corporations play an important role in the establishment of these centers.

Foremost among the technological developments in the overseas industries is the production of sterilized "long-life" milk products that can be stored for up to several months without refrigeration.

Other notable techniques in use abroad include a fully mechanized cheese production system developed in Italy and a highly sophisticated system for powdered milk production developed in Israel. A hard cheese production technique that reduces the ripening period is employed in the U.S.S.R. Also, some Australian dairy plants utilize computerized process control systems.

Fruit and vegetable processing.—Considerable expansion is forecast for frozen fruit and vegetable production in several countries, most notably Australia, Brazil, Israel, the Netherlands, and Spain. Producers in the latter four countries plan to enlarge their facilities and invest heavily in quickfreezing equipment in response to rapidly growing export sales of their frozen products.

Opportunities for sales of aseptic systems and freezedrying and dehydrating equipment also should increase in the surveyed markets in the years ahead. Although research indicates that relatively few manufacturers have installed aseptic processing systems, a large number express intense interest in the technique. Freezedrying techniques are being applied increasingly to some vegetables, citrus fruits, and even baby foods. Use of dehydration methods is also on the rise, particularly for soups, spreads, and sauces.

Many foreign producers emphasize the importance of machinery with multimaterial processing and packaging capabilities since they generally process a variety of products and package them in a range of different types of containers.

Bakery products manufacturing.—Although numerous small bakeries are prevalent in all the researched markets, the large firms usually account for the greater proportion of total production. There are two notable exceptions—France and Germany. Consumers in these two nations have a marked preference for freshly baked bread and other bakery items and therefore heavily patronize small neighborhood concerns. The worldwide trend, however, points toward continued expansion of principal producers who can achieve economies of scale.

Large baking concerns generally utilize the most sophisticated equipment available, including continuous process ovens and continuous doughmixing apparatus. Even a number of small- and medium-size firms in France and Germany are fully automating their presently semiautomatic operations and are purchasing packaging equipment.

Sugar refining.—Australia, Venezuela, and the U.S.S.R. are among the most promising markets for sugar production and packaging machinery. Fully automated methods of production are gaining acceptance in Australia, where computer-controlled systems are now used in sugar refineries. A possible shift from paper to plastic for retail packaging of sugar by Australian producers could provide substantial sales opportunities for makers of forming and filling machines.

Venezuela's 5-year National Sugar Plan earmarks over $200 million for construction and expansion of sugar mills during the 1975-1980 period. The country's sugar mills generally employ processes similar to those used in the United States. One mill uses a new, quite advanced processing technique developed by a Venezuelan. This process, called Rotocel, employs a diffusor technique to obtain syrup from the cane, and then evaporates the syrup into a concentrated form.

Current plans by the Soviet sugar industry call for establishment of very large refineries capable of serving entire regions of the country. Official policy is directed toward greater mechanization, in particular the introduction of automatic diffusion processes to all plants. Significant increases in expenditures on packaging machinery also are likely.

Beverage manufacturing.—The trend toward concentration of production, with a shift from small to large, modern plants, is evident in most of the world's beverage industries. In some countries, this development is being accelerated by shortages of materials such as glass. These shortages are forcing small operations out of business and increasing the hold of big producers on the market. The growing predominance of large beverage manufacturing establishments should contribute to a greater demand for sophisticated equipment, particularly high-speed bottling and canning lines.

There is widespread interest among beer producers in the automation of production techniques.

Table 1.—Food processing and packaging equipment markets, by country, 1974 and 1978
(in millions of U.S. dollars)

	Food processing equipment		Food packaging equipment		Total food processing, packaging equipment	
	1974	*1978*	*1974*	*1978*	*1974*	*1978*
Australia ..	77	110	26	35	103	145
Brazil	66	115	24	44	90	159
Canada	58	91	28	45	86	136
France	307	419	127	173	434	592
Germany ..	412	549	114	216	526	765
Iran	7	30	4	15	11	45
Israel	17	26	3	5	20	31
Italy	213	404	39	76	252	480
Japan	504	768	294	360	798	1,128
Mexico	32	48	15	22	47	70
Netherlands	160	164	40	56	200	220
Spain	36	50	35	54	71	104
Sweden	134	149	32	37	166	186
United Kingdom	155	173	91	121	246	294
U.S.S.R.	677	1,085	147	348	824	1,433
Venezuela ..	46	55	6	8	52	63
Total	2,901	4,236	1,025	1,615	3,926	5,851

Source: Bureau of International Commerce, Office of International Marketing research reports.

One German brewery is experimenting with a continuous-flow method of brewing, and semicontinuous fermentation procedures are being adopted in other countries.

Generally, overseas manufacturers of soft drinks and beer market their products in glass bottles, both returnable and nonreturnable. Use of metal cans is limited, but growing.

Fish and seafood processing.—Fish and seafood processing is a major industry in Japan and the U.S.S.R.—and much larger in these countries than in the United States. The industry is given special mention by researchers of the Spanish market, who note that it exhibits particularly good sales potential for American equipment manufacturers. The most significant recent change in Spain's industry has been replacement of older fishing trawlers with large, modern factory ships which stay at sea as long as 6 months, preprocessing and freezing the catch. About 30 of these vessels are built each year and are equipped with gutting, cleaning, filleting and freezing machinery.

Other markets where strong interest is expressed in U.S.-made equipment include Italy, Germany, the U.S.S.R., Venezuela, and Canada. Excellent sales opportunities exist in these countries for fish filleting, scaling, opening, and grinding machines; seafood shelling machines; and quickfreezing equipment.

Miscellaneous food products manufacturing.—Foreign producers of coffee, tea, spices, flavorings, pasta products, potato chips and other miscellaneous processed foods—whose operations are among the most "Americanized"—are excellent sales prospects for U.S. equipment manufacturers. Output of freeze-dried coffee and spices as well as potato chips and other snack items is expanding rapidly in most countries in response to rising consumer demand. Overseas producers look to U.S. industry as the prime source for the required equipment and production technology.

Interviews with processors indicate that the machinery most in demand includes spray-drying equipment for instant coffee and instant tea, freeze-drying equipment for coffee and spices, and complete systems for the production of potato chips and similar snacks. Demand for packaging equipment, particularly vacuum packaging apparatus, will increase as new products are introduced.

Packaging—Trends in Materials Usage

The growth of food packaging equipment markets is dependent not only on the rise in output of packaged foods but also on changes in use of packaging materials. In fact, in some highly industrialized countries, the need to switch from one material to another may well be the dominant factor in the forecast increases of packaging equipment sales.

Three recent developments are causing reevaluation of materials allocation by many food processors in developed countries. First, the increasing scarcities of basic materials such as paper, tinplate or aluminum are being felt by many firms, particularly those that are dependent on foreign sources for the respective raw materials. Second, national environmental concerns, whether reflected in legislation or informal public pressure, are forcing manufacturers to pack their foods in materials that minimize the proliferation of solid wastes. Many processors are thus turning to recyclable or biodegradable containers and wrappers.

The third development, the rising price of petroleum, is probably the most important determinant of future packaging trends. It is influencing the costs not only of petroleum-based materials and energy to operate the packaging machinery, but also of nonpetroleum based materials that require heavy amounts of energy in the manufacturing process.

Food manufacturers, beset by all these pressures, are more likely now to reconsider packaging techniques and materials usage than ever before. In Japan, for example, glass bottling still predominates in the beverage industry, but the relatively large amount of energy required to produce glass is creating a trend toward use of metal cans.

The application of plastics is rising, although shortages and high prices of petrochemical derivatives are prompting consideration of recyclable varieties. In some countries, steps are being taken to use more of the short-supply plastics, due to even

Table 2.—Food manufacturers' sales,[1] *by 13 surveyed countries and the United States*
(in millions of U.S. dollars)

Country	Year	Meat, poultry, eggs	Dairy products	Fruits, vegetables	Grain products	Bakery products	Sugar, confectionery products	Fats, oils	Beverages	Fish, seafood	Misc. food products	Total processed foods
Australia [2]	1972	1,699	1,072	396	364	472	—	140	696	21	—	5,881
Brazil	1969	222 [3]	209 [4]	70	316	71 [5]	n.a.	448	290	14	92	3,500
Canada	1971	2,470	1,493	579	921	661	485	139	1,236	392	870	9,246
Germany	1973	8,852	4,704	1,111	1,630	3,778	2,222	1,593	5,074	444	2,667	32,075
Israel [6]	1971	59	93	—	133	58	—	74	50	—	—	626
Italy [7]	1971	—	751 [7]	—	1,314	—	—	537	1,181	—	—	7,056
Japan	1973	1,343	2,322	1,857	2,394	1,045	4,209	1,709	8,414	3,098	2,680	29,071
Mexico	1970	239	322	175	495	317	401	432	945	101	247	3,674
Netherlands	1971	1,038	1,470	317	158	401	543	502	539	35	1,271	6,274
Spain	1971	2,609	603	239	673	820	375	126	914	177	1,406	7,942
United Kingdom	1972	3,100	3,195	1,574	966	1,806	1,752	895	4,782	458	1,197	19,725
U.S.S.R.	1973	10,800	10,000	4,000	7,800	5,600	4,200	3,500	7,400	3,800	3,200	60,300
Venezuela	1971	89	206	66	174	73	113	121	279	36	152	1,309
United States	1972	31,499	10,312	11,482	12,162	7,916	6,641	6,901	13,902	1,781	6,326	108,922

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[1] Data for Japan, Mexico, and Spain reported as gross production, United States as shipments, and all others as sales by manufacturing establishments. Data on France, Iran, and Sweden not reported in research.

[2] Figures on sales of sugar, confectionery products, and miscellaneous food products available only as combined total of $1,021 million.

[3] Excludes sales of eggs.

[4] Excludes sales of fresh milk.

[5] Excludes sales of bread.

[6] Combined sales of fruits, vegetables, fish, and seafood total $87 million; confectionery products, $31 million; and sugar and miscellaneous food products, $41 million.

[7] Combined sales of meat, poultry, eggs, fruits, vegetables, fish, and seafood total $1,582 million; bakery and confectionery products, $842 million; and sugar and miscellaneous food products, $849 million. Sales of ice cream included in figures on bakery and confectionery products.

Source: Bureau of International Commerce, Office of International Marketing research reports.

greater shortages of other materials. Canada, for example, is doing research on the use of plastic bottles for soft drinks in a period of scarcity of soda ash needed in glass production.

Most of Europe, on the other hand, is feeling the pinch of high petroleum prices seriously enough to switch from plastics to metals, of which the supply is relatively adequate on the continent.

The developing countries covered in the Survey will face dramatic increases in the use of all packaging materials. Rising income levels and growing industrialization are leading to proliferation of supermarkets which, in turn, places heavy pressures on food processors to introduce proper packaging techniques. These firms almost certainly will be confronted with the same packaging materials limitations faced by the rest of the world.

U.S. manufacturers of packaging equipment have had plenty of experience in dealing with domestic users that modify their packaging materials and techniques. Similar upcoming modifications in overseas food industries should make U.S. equipment most appropriate for these applications.

Competitive Assessment

Many American manufacturers of food processing and packaging equipment are expanding their sales horizons to include a number of foreign markets. They are finding that the stiffest competition is offered by European firms.

In several non-European countries, local manufacturers offer strong competition as well, because they may have a number of advantages over U.S. and European suppliers, such as lower prices, tariff protection, short delivery times, prompt parts supply and repairs, and custom-design capabilities. However, the technological gap between locally produced and imported equipment generally is wide, leaving each with its distinct market. Specialized, high-capacity, and advanced types of machinery are predominantly imported from various European and American makers.

Leading German, Italian, Swedish, British, and other European manufacturers of food processing and packaging equipment have been marketing their products effectively throughout the world for some time. They rely heavily on export sales to maintain their economic viability. To ensure their sales success, they market their machinery aggressively through a large number of capable sales representatives and maintain reliable after-sales service and parts-supply support. Most devote considerable attention to developing contacts and promoting new items.

Overseas buyers would like to see a stronger marketing effort by U.S. food processing and packaging equipment manufacturers in their respective countries. They feel that the quality of the American-made equipment to which they have been exposed matches or surpasses that of most European makers, and that prices are comparable.

These buyers suggest the following methods to achieve greater foreign exposure:

1. *Establishing effective sales representation and servicing facilities abroad.* For names of agents and distributors, see *Trade Lists,* printed separately for most surveyed countries as part of the Global Marketing Program and available at Commerce district offices or the Office of Export Development, BIC/DIBA, U.S. Department of Commerce, Washington, D.C. 20230.
2. *Advertising in appropriate trade publications.* For a list of suitable foreign periodicals, see *Trade Lists.*
3. *Direct mailing of sales and technical literature.* For a list of potential buyers, again see *Trade Lists.*
4. *Participating in overseas food processing and packaging equipment trade promotional events.* See *Schedule of Events* on page 149 of this publication.

The Department of Commerce offers to assist U.S. food processing and packaging equipment firms in establishing a foothold in overseas markets. Companies interested in obtaining more information on this program should contact the nearest Commerce Department district office.

Country Market Surveys

Surveys on 16 primary country markets for food processing and packaging equipment are contained in this section. These surveys are based on comprehensive on-site market studies conducted for the U.S. Department of Commerce in the respective countries under supervision of the U.S. Foreign Service—Department of State.

Each *Country Market Survey* covers:

Market Size

- Narrative and statistical presentation of the size of the market for food processing and packaging equipment, including historical and projected growth
- Discussion of imports and the U.S. share of the import market

Competitive Environment

- Review of the competitive position of domestic and third-country food processing and packaging equipment manufacturers

Sales Opportunities

- Identification of specific food processing and packaging equipment expected to have high sales potential for U.S. exporters

The Food Processing Industry

- Review of the food processing industry's structure and growth potential; this section includes recent industry data, such as sales by manufacturers and capital expenditures, on each of the industry's 10 major sectors:
    - Meat, poultry, and eggs
    - Dairy products
    - Fruits and vegetables
    - Grain milling
    - Bakery products
    - Sugar and confectionery products
    - Fats and oils
    - Beverages
    - Fish and seafood
    - Miscellaneous food products
- In-depth profiles of the industry sectors expected to offer the best export potential for U.S. food processing and packaging equipment manufacturers, including information on major processors and on their expansion plans, identification of new or highly developed food processing or food packaging methods in use, and a description of a typical food processing/packaging system

Trade and Technical Regulations

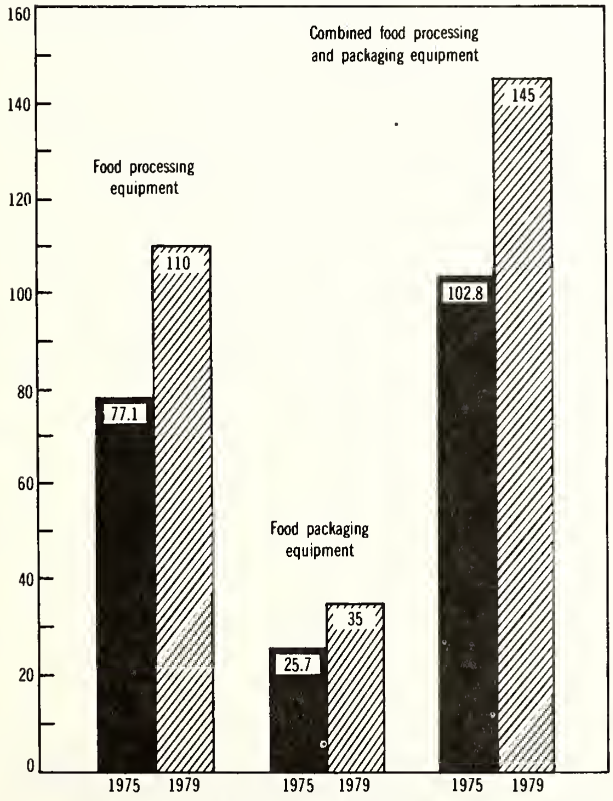
- Mention of duty rates, non-tariff trade barriers, and technical standards and requirements

Australia

Australia, one of the world's major food producers and exporters, offers a strong market for food processing and packaging equipment through the 1970's. The Australian population, expected to grow by one-third in the next 10 years, is demanding more and better processed foods, as are the nation's overseas customers. An average annual growth rate of 9% is predicted for the food processing and packaging equipment market from 1975 until at least the end of the decade.

Australia: Food processing and packaging equipment market, 1975 and 1979.

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Australian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

The market is forecast to climb at an average rate of 20% annually from $70.8 million [1] in 1973 to more than $100 million in 1975 (see graph and table 1). While a projected slowing in Australia's exports of dairy products and some meat products may reduce the growth rate during the next 2 years, rapidly escalating domestic sales of beverages and confectionery products, plus the continuing foreign demand for Australian beef, should spur recovery. The total market is expected to reach $145 million in 1979.

Demand for *food processing equipment,* which had remained static from 1968 through 1972, began to accelerate in 1973, in which year sales reached $54.7 million. The market is predicted to grow, at an average annual rate of over 18.5%, from the 1973 figure to $77 million in 1975. Sales are projected to rise more than 9% annually during the next 4 years, reaching $110 million in 1979.

Imports of food processing equipment in 1975 are expected to total $16.5 million, of which the United States should supply some 30%, the largest single share. This percentage share of imports is projected to continue into 1979. American food processing machinery, which is particularly suited to large-scale production, is expected to grow steadily in popularity in Australia's expanding market. Sales of U.S.-made equipment are forecast to reach $5 million in 1975 and nearly $8 million in 1979. Domestic firms now supply about 75% of the food processing equipment used in Australia, and they are ex-

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[1] All statistical figures in this survey are presented on an Australian fiscal year (July-June) basis. All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1 = A$0.86 (1972); A$0.78 (1973); A$0.67 (1974 and subsequent years).

Australia—Economic Indicators (1973)

Gross national product:	**$45.2 billion**
Total country imports:	**$5.6 billion**
Imports from U.S.:	**$1.2 billion**
Total country exports:	**$9.2 billion**
Exports to U.S.:	**$1.0 billion**
Population:	**13.2 million**

pected to continue to do so throughout the 1970's. These companies offer equipment of customized design, backed by a reputation for excellent service and protected by a 41% tariff rate.

The market for *food packaging equipment* is expected to grow nearly as fast as that for food processing machinery. Sales are forecast to rise at an average annual rate of 8%, going from more than $25 million in 1975 to $35 million in 1979. Sales totaled $16 million in 1973.

Despite its smaller size and marginally slower growth rate, the food packaging equipment market is of considerable interest to foreign manufacturers, who supply roughly 80% of the demand. Imported items that do not duplicate equipment made locally are subject to little or no duty; much of the sophisticated machinery required by Australian end-users is not made by the small domestic packaging equipment industry. Imports are anticipated to exceed $20 million in 1975 and to reach $29 million in 1979. U.S. suppliers are expected to maintain a 25% to 27% share of the import market.

Competitive Environment

In the years ahead, local manufacturers catering to the Australian market will continue to be the major competitors to U.S. manufacturers in sales of food processing equipment, while European (particularly German) and Japanese producers are expected to offer increasing competition in sales of food packaging equipment. American suppliers can improve their position in this increasingly competitive market by ensuring greater exposure of their products, by seeking reliable sales representatives, and, particularly, by offering adequate after-sales service.

A review of the domestic and third-country competition faced by U.S. suppliers in the Australian marketplace follows.

Food processing equipment.—The Australian food processing equipment industry provides a wide range of specialized machinery of good quality for each sector of the food industry. The approximately 75 domestic food processing equipment firms produced an estimated $60 million worth of such machinery in 1974, of which $5 million was exported and $55 million was purchased by local end-users.

Domestic manufacturers have a number of advantages in this market, including better servicing capabilities, tariff protection, and custom-design expertise. The bulk of bakery and meat processing equipment is manufactured in Australia from local design to fit specific plant requirements. In other food processing equipment categories, however, foreign suppliers are generally considered to offer better quality and more sophisticated products. As a result, local manufacturers continually seek licenses to manufacture equipment of European and American design.

Major Australian manufacturers of food processing equipment include Bell Bryant Pty. Ltd., which produces a wide range of equipment for most sectors of the food industry, particularly the dairy, meat, beverages, and sugar and confectionery sectors, and Mauri Brothers & Thompson Ltd., which makes slaughtering equipment, bacon-forming, sawing machines, evaporators, spray driers, washers, pasteurizers, heat exchangers, mashing vats, and clarifiers. Anderson Equipment Co-Operative Ltd. produces vats, tanks, crushers, and evaporators. J. Wildridge & Sinclair Pty. Ltd. manufactures heat exchangers, blast freezers, flow freezers, compressors, and other quick-freezing systems. Jaybee Engineering Pty. Ltd. makes slaughtering equipment, mixers, cookers, crushing machines, graders, and grinders. All of these companies are locally-owned but also manufacture under license from and act as agents for foreign firms supplying the Australian market.

Table 1.—Australia: The market for food processing and packaging equipment, 1974, 1975, and 1979

(in millions of U.S. dollars)

	1974	1975	1979
Food processing equipment (by sector)			
Meat, poultry, and eggs	12.7	11.2	16
Dairy	10.4	10.4	12
Bakery	7.5	8.2	10
Sugar and confectionery	9.0	10.4	15
Beverages	10.4	11.2	13
Other sectors	21.3	25.7	44
Subtotal	71.3	77.1	110
Food packaging equipment			
Forming, filling, sealing	9.5	9.8	13
Wrapping, packing	7.1	8.0	11
Marking, inspecting	3.9	4.2	5
Container/product/package preparation and handling	3.4	3.7	6
Subtotal	23.9	25.7	35
Total food processing and packaging equipment	95.2	102.8	145

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Australian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Australia: Imports of selected categories of food processing and packaging equipment by country of origin, 1972-74
(in thousands of U.S. dollars)

	1972	1973	1974
Food Processing Equipment			
Cream separators			
United States	—	—	—
Sweden	—	78	536
Germany	148	165	432
Others	18	30	15
Total	166	273	983
Other dairy processing machinery			
United States	87	72	254
New Zealand	395	469	669
Netherlands	81	554	119
Sweden	100	291	80
Others	472	267	434
Total	1,135	1,653	1,556
Presses, crushers, and other machinery for wine making, cider making, etc.			
United States	162	165	228
France	52	67	357
Switzerland	128	—	—
Others	79	167	316
Total	421	399	901
Machinery for milling grain, etc.			
United States	—	—	60
United Kingdom	121	122	127
Germany	87	99	104
Japan	59	65	97
Others	49	70	30
Total	316	356	418
Machinery for making fine bakers' wares			
United States	—	—	45
United Kingdom	147	217	328
Germany	—	237	74
Netherlands	—	58	22
Others	83	106	149
Total	230	618	618
Cocoa and confectionery making machines			
United States	—	—	—
Germany	126	153	89
United Kingdom	88	55	37
Denmark	57	76	15
Others	156	202	75
Total	427	486	216
Fruit and vegetable preparing machinery			
United States	465	87	715
United Kingdom	107	404	149
Italy	—	101	15
Others	110	84	54
Total	682	676	933
Other food processing machines			
United States	902	1,268	1,564
Germany	617	963	1,117
United Kingdom	493	409	447
Italy	291	172	358
Others	917	601	1,266
Total	3,220	3,413	4,752
Packaging equipment[1]			
Bottling machines, complete			
United States	192	51	447
Germany	—	610	1,222
United Kingdom	131	97	75
Italy	59	114	60
Others	38	54	30
Total	420	926	1,834
Automatic carton filling and closing machines			
United States	228	626	745
Sweden	540	345	596
Germany	298	123	313
Italy	151	—	75
Others	44	265	551
Total	1,261	1,359	2,280
Bagging machines			
United States	—	—	48
United Kingdom	48	63	127
Germany	59	150	48
Canada	184	—	—
Others	85	74	48
Total	376	287	271
Molding and wrapping machines for butter, margarine, etc.			
United States	—	—	15
Germany	99	233	179
Switzerland	143	—	30
France	151	—	—
Others	76	5	119
Total	469	238	343

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[1] Since Australian trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Australian trade sources to have accounted for 65% of total packaging equipment imports in 1972, 65% in 1973, and 68% in 1974.

Source: Commonwealth Bureau of Census and Statistics for 1972 and 1973. Data for full year 1974 estimated, based on actual 6-month figures.

There are several manufacturing subsidiaries of American firms in Australia. FMC (Australia) Ltd. manufactures slaughtering equipment, graders, blanchers / cookers, shredding / grinding / chopping machines, corers, pulpers, homogenizers, and spray driers. J. W. Greer (Australia) Pty. Ltd., a subsidiary of Columbia Precision Corporation, produces graders, cookers, prawn-slitters, IQF systems, and mixers. Sybron (Australia) Pty. Ltd. manufactures homogenizers, extractors, disintegrators, blanchers, and pulpers.

British subsidiaries include Simon Engineering Australia Ltd., which makes dough mixers, biscuit coolers, and grain milling equipment; Baker Perkins (Australia) Pty. Ltd., which produces breadmaking machines, dough-mixing-, kneading-, dividing-, rounding-, proofing machines, and continuous process ovens; Kelly & Lewis Machinery, which manufactures fillers, graders, chemical peelers, pulpers, and coring machines; and Thomas Robinson & Son Pty. Ltd., which makes crushing, conditioning, reducing and mixing machines, and flour hoppers. A Swedish subsidiary, Alfa-Laval Pty. Ltd., produces spray-driers and evaporators.

The extent of European manufacturers' penetration of the Australian market for food processing equipment is indicated in table 2, which provides a breakdown of imports from major supplier countries for the years 1972 through 1974. European suppliers enjoy a good reputation in Australia because of their products, quality, design, price, and suitability to local conditions. Their equipment is in particular demand in the meat processing, dairy, confectionery, and brewing industries.

Some of the more important third-country competitors in the food processing equipment market are Baker Perkins Ltd., Simon Engineering Ltd., A.P.V. Co. Ltd., and Gordon and Johnson Pty. Ltd., all of the United Kingdom; Albert Handtmann, Westfalia Separator A.G., Kramer and Grebe, Steinecker, and A. Ziemann A.G., all of Germany; Johann Laska and Sons of Austria; Alfa-Laval of Sweden; and Aasted of Denmark.

Table 3.—Australia: Number of enterprises in food processing industry sectors by size[1] of enterprise, 1969

Sector	Large	Medium	Small
Meat, poultry, and eggs	107	79	32
Dairy	53	53	349
Fruit and vegetable	37	27	113
Grain	18	36	132
Bakery	63	60	1,591
Sugar and confectionery[2]	—	—	—
Fats and oils	5	4	37
Beverages	38	40	611
Fish and seafood	3	1	8
Miscellaneous food products	83	37	485

[1] Large = 100 or more employees.
Medium = 50 to 99 employees.
Small = 49 or fewer employees.

[2] Included in "Miscellaneous food products."

Source: Commonwealth Bureau of Census and Statistics.

Food packaging equipment.—The domestic food packaging equipment manufacturing industry is relatively small, with about 28 manufacturers producing roughly $5.5 million worth of equipment for local consumption and $1.5 million for export in 1974. While local manufacturers produce a limited range of specialized equipment, generally they cannot compete with foreign suppliers in either price or quality. The small size of the Australian market and the economies of scale and superior design achieved by overseas manufacturers are the principal reasons for reliance on imports.

Although tariffs protect certain items such as bottling machines, most imported food packaging equipment is brought into Australia duty-free under customs "by-law" treatment; i.e., the equipment is imported duty-free from all sources unless similar equipment is made in Australia.

In the future, domestic manufacturers are likely to continue producing specialized food packaging equipment. The export market will offer increasing sales potential; in 1975, as much as 33% of the total food packaging equipment production in Australia may be exported, chiefly to Southeast Asia. Types of equipment exported in the past include cartoners and wrappers.

Important Australian-owned food packaging equipment manufacturers, with their principal machinery categories shown in parentheses, include Advance Machinery Pty. Ltd. (cartoning, multipacking, and gumming machines); Mauri Brothers & Thompson Pty. Ltd. (bottle-filling and labeling equipment); Barry Wehmuller Pty. Ltd. (bottle washers and rinsers); and Micro Packaging Engineers Pty. Ltd. (cartoners, cappers, crimpers, and sealers).

Major manufacturing subsidiaries of U.S. firms include W. R. Grace Australia Ltd., which produces vacuum- and shrink-packing machinery, and FMC (Australia) Ltd., which manufactures wrappers checkweighers, palletizers and accumulators. Meyer-Davleco Pty. Ltd. has a licensing agreement with Geo. J. Meyer Manufacturing to produce filling equipment.

The British-owned firm Baker Perkins (Australia) Pty. Ltd. manufactures bread-slicing and bread-wrapping equipment and shrink-wrappers. Another U.K. sudsidiary, Globus Poly-Clip Pty. Ltd., manufactures a range of clipping machines under license from European producers and imports vacuum form/fill/seal equipment systems.

Third country suppliers hold a strong position in the Australian market for forming/filling/sealing equipment. European-made bottle fillers, can closers, and vacuum form/fill/seal systems are believed to be superior in design and particularly suitable for the small runs required by Australian processors. Manufacturers from Europe and Japan hold a significant share of the market for high-speed cartoning and shrink-wrapping machinery because of flexible design, product support, and successful early entry into the field.

German suppliers have been particularly successful in assessing the preference for medium-size machinery in Australia and catering to it by offering not only a cheaper and more flexible line of equipment but also by emphasizing customer relations and providing well-informed sales representatives and expert after-sales service.

Major third-country suppliers in the packaging equipment market include Toyo Automatic Packing Machine Co. of Japan, Hansel and Ortmann & Herbst of Germany, Simonazzi, V. Tonazzi and Co., and Automac of Italy, and Tetra Pak International of Sweden.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International marketing, reveals that American manufacturers will find favorable opportunities for sales of the following types of equipment to the major sectors of the Australian food processing industry:

Food Processing Equipment

Meat.—Slaughtering equipment, and automatic cut-up machines.

Dairy.—Ice cream preparation, freezing, cutting, and coating equipment; and cheese-making machines.

Fruit and vegetable.—Apple processing systems, corers, chemical peelers, cooling/freezing equipment, abrasive peelers, and continuous blancher/cooker/cooler/sterilizer systems.

Sugar and confectionery.—Tabletting machines.

Beverages.—Brewhouse straining vats and clarifiers, and soft drink carbonating equipment.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquids, and vacuum form/fill/seal systems.

Wrapping, packing.—Direct and overwrap wrappers, shrink-wrappers and tunnels, and cartoners.

Marking, inspecting.—Coding equipment, checkweighers, and imprinting/printing equipment.

Container product/package preparation and handling.—Palletizers, and bottle spotters.

The research survey indicates that the following U.S.-made products also are in strong demand by Australian food processors: continuous mixers; swept-surface, heat-exchange process systems; liquid nitrogen tunnel freezers; and condensors/evaporators.

Table 4.—Australia: Basic data on food processing industry sectors, 1972

Sector	Sales by manufacturing establishments	Value-added production	Capital expenditures
Meat, poultry, and eggs	1,699.3	463.2	47.5
Dairy	1,071.6	223.7	26.1
Fruit and vegetable	395.5	141.8	11.2
Grain	363.8	98.5	8.1
Bakery	471.9	231.3	16.7
Sugar and confectionery[1]	—	—	—
Fats and oils	140.0	38.1	6.2
Beverages	696.0	290.8	49.4
Fish and seafood	21.3	5.6	0.4
Miscellaneous food products	1,020.9	328.9	35.3

[1] Included in "Miscellaneous food products."

Source: Commonwealth Bureau of Census and Statistics, *Manufacturing Establishments: Summary of operations by industry class—Australia, 1971/72.*

The Food Processing Industry

The Australian food industry comprises more than 4,000 food processing establishments (see table 3). Total capital investment by the industry in 1972 exceded $200 million, and that figure was estimated to have increased by 20% in 1973. Sales in 1972 totaled $5.9 billion, while total value-added production amounted to $1.8 billion.

In addition to exporting large quantities of meat and sugar, Australians at home are consuming increasing amounts of convenience foods. In 1972, per capita consumption of selected processed food products reached the following levels: poultry, 27.7 pounds (lb); meat, 200 lb; cheese, 9.2 lb; vegetables, 290 lb; fruit, 60 lb; soft drinks, 12.5 gallons (gal); and beer, 28 gal.

The Australian food industry traditionally has been characterized by many small- to medium-size suppliers and low returns. However, large overseas firms entered the market in the 1960's with a merger and acquisition strategy; and the industry is now less fragmented. Many American companies acquired Australian companies, giving U.S.-based food processing equipment manufacturers a valuable entry to the market.

The trend toward self-service marketing of food items has led to the use of a great variety of packaging materials, of which about 40% are paper or cardboard. Fiberboard containers are now used extensively for meat, cereals, beverages, canned goods, and fresh fruits and vegetables. Demand for fiberboard is expected to grow along with an increasingly sophisticated approach to packaging in Australia. Use of polyethylene-coated cardboard milk cartons and wraparound fiberboard cartoning should also increase significantly. Corrugated as well as polyethylene containers are replacing wooden and wire ones in the bulk fruit and vegetable packaging market. Spurred by the popularity of easy-open beverage cans, plus the continuing expansion of canned fruit sales, metal containers now comprise 28% to 30% of the total food packaging materials market and are expected to remain at this level through the next 5 years.

The most significant move has been toward flexible plastic packaging. The meat industry has been a major market for "Cryovac" and similar products. Convenience-shopping trends have increased demands for shrink-wrapping polyvinyl chloride and polyethylene for packaging fruit, vegetables, meat, and other food items. It appears likely that plastics, currently representing 15% to 18% of the food packaging materials market, eventually will replace glass containers in the milk, fruit juice, and wine markets. Although glass still accounts for some 10% of packaging materials used by the food industry (it remains popular in the dairy and beverage industries), its share is declining. Concern over waste-disposal problems has offset the convenience appeal of the nonreturnable glass container.

Table 4 provides 1972 data on capital expenditures, sales, and production by each of the 10 major sectors of the food processing industry in Australia. A review of six of the largest sectors follows.

Meat, poultry, and egg processing.—Total meat production in Australia rose in 1973 to 2.39 million tons, up from 2.32 million tons in 1972 and 2.05 million tons in 1971. Poultry production in 1972 increased to 163.2 million kilograms (kg) over the 1971 level of 151.5 million kg, then dropped to 159.7 million kg in 1973.

The level of capital investment in the meat, poultry, and egg processing industry rose from $47.5 million in 1972 to nearly $60 million in 1973. The 1974 level of investment is estimated to be approximately $70 million. Large producers (with 100 employees or more) are estimated to account for 90% to 95% of total sales in the entire sector.

Prospects for a worldwide shortage of red meat into the 1980's should stimulate growth of Australian beef output. The industry, which in the past has been geared to export, is now taking steps to expand demand in the domestic market with the establishment of bulk meat discount stores for consumers.

Of the several major Australian companies operating in the meat industry, F. J. Walker Ltd. is one of the largest, with an annual turnover well in excess of $150 million. This firm's subsidiaries include Aberdeen Feed Lot Pty. Ltd., Hunter River Meat Packing Co., Metropolitan Meat Co. Pty. Ltd., Silvester Bros. Pty. Ltd., and Walker Trading Co. Pty. Ltd. Another major company, Thomas Borthwick and Sons, operates extensively throughout Australia and is a major exporter of beef; its sales in 1972 exceeded $180 million. W. Angliss and Co. (Australia) Pty. Ltd. also exports meat worldwide.

Huttons Limited is prominent in the meat sector with subsidiaries J. C. Hutton Pty. Ltd., Foggit Jones Pty. Ltd., and Kyneton Meat Products. Australian Bacon Limited is a holding company for subsidiaries (including Anderson Processed Foods Pty. Ltd. and Victorian Bacon Pty. Ltd.) concerned in the manufacture and export of hams and bacon. The largest poultry producer in Australia is Inghams Enterprises Pty. Ltd. Associated companies include Golden Poultry Farming Industries Ltd. and Eastoe's Transport Pty. Ltd.

Several companies in the meat industry have expansion plans. F. J. Walker Ltd., plans construction in 1975 and 1976 of a new abattoir to handle slaughtering, boning, chilling, and packing meat for export. The plant's planned capacity is 400 head of cattle and 3,000 sheep per day. Total expenditures, excluding land, will be about $5 million.

Inghams Enterprises Pty. Ltd plans in 1975 to install a complete Dutch "Meyn" poultry defeathering and eviscerating system with a capacity of 9,000 birds per hour. After the system is installed (at a cost of roughly $1.5 million), the company plans to purchase new freezing equipment, including a liquid nitrogen freezer, to accommodate the new output.

Thomas Borthwick and Sons plans capital expenditures of more than $7 million to expand its facilities in 1975; included is a meat-processing expansion program for Melbourne.

Woolworths ((Meatex) Pty. Ltd. plans to establish a new meat processing plant with a capacity of 400,000 lb of meat per week in Sydney by 1977. Expenditures for food processing equipment are estimated to be $1.2 million. Meats to be processed include beef, pork, and lamb products.

In their efforts to restrain escalating labor costs, Australian meat processors are looking toward semiautomation and are seeking equipment that is easily cleaned and simply designed for facility of maintenance and service. A new processing technique of particular interest to these firms is the production of portion-controlled beef patties using mincers, blenders, portion-cutting equipment, and a nitrogen freezing tunnel.

Sustained solid growth appears likely in the poultry industry. Carryout food operations are providing an important demand for poultry, and existing major suppliers will probably continue to expand their operations to meet the higher demand.

The poultry processing and packaging system used by Ingham's Enterprises Pty. Ltd. at its plant in Casula, N.S.W., illustrates the technological level of equipment utilization considered typical in this sector. This plant, which has a current processing capacity of 6,000 birds per hour, operates on a continuous system that includes stunning, killing, defeathering, eviscerating, and cleaning. U.S.-made "Gainsville" cutting machines (supplied by Gordon and Johnson) are used to cut fresh whole birds into pieces for a major carryout chicken retailer. Whole birds to be frozen are vacuum packaged into plastic bags by the Cryovac process and immersed in glycol tanks for 30 minutes prior to being packed into cartons and frozen by a blast freezer. The processing system was supplied by Gordon and Johnson Pty. Ltd. and the original packaging equipment was supplied by W. R. Grace Australia Ltd.

Dairy products manufacturing.—Total milk and dairy products output declined slightly from 7.2 billion liters in 1971 to 7.1 billion liters in 1973. A primary cause was that Britain shifted its purchases of milk to suppliers in the European Common Market. Declines in output of some processed milk products, particularly butter, have been offset by growth in others, chiefly powdered, skim and flavored milk, cheese, ice cream, and yogurt. From 1971 through 1973, cheese production rose from 746 million liters to 871 million, while output of ice cream increased from 42 million gal to 46 million.

Approximately 70% to 80% of total industry sales are credited to enterprises with 100 employees or more. Capital investment in the dairy sector in 1974 was valued at approximately $35 million.

The Australian dairy industry is strictly regulated, with profit margins for farmers, processors, and vendors set by the relevant state authorities. Cooperatives and publicly listed companies dominate the industry.

Among the leading companies in the dairy sector is Q.U.F. Industries Ltd., a major milk and ice cream producer with a yearly turnover of $150 million; its subsidiaries are Pauls Ice Cream and Milk Ltd., Sundale Distributors, Australian Food Distributors Pty. Ltd., The Southern Queensland Dairy Company Ltd., and Peters-Arctic Delicacy Company Ltd.

Petersville Australia Ltd. is a holding company for manufacturers, distributors, and exporters of dairy and other food products. Major subsidiaries include Peters Ice Cream (N.S.W.) Pty. Ltd. (the leading Australian ice cream company), Peters Milk (N.S.W.), Gordon Edgell Pty. Limited, and Birds Eye Foods (Australia) Pty. Ltd. Consolidated Foods Ltd. is also a holding company for milk processors, retail and wholesale dairymen, and milk, bread, and cheese manufacturers. Major subsidiaries include Metropolitan Dairies Pty. Ltd., Victorian Dairies Ltd., and Frosto Frozen Foods Limited. Dairy Farmers' Co-Operative Ltd., owned by more than 5,000 farmers, is a major supplier to the New South Wales market.

Two of these companies have major expansion plans. The Dairy Farmers' Co-Operative will complete a $1.5-million expansion of its processing facilities in Sydney in late 1975. And Q.U.F. Industries Ltd. expects to double its current output when it completes a $1.78-million expansion of its ice cream production facilities in 1975.

Although the small profit margins received by milk suppliers limit their ability to finance conversion to new or more expensive packaging systems, they are using some wax-coated cartons, flexible packages, and plastic milk bottles. And while the small size of the Australian market makes full automation uneconomical, cheese and ice cream makers are receptive to semiautomation. A relatively new, highly developed cheese-packaging process now coming into use minces, melts, and packs liquid cheese into foil.

A typical processing plant is that of the Dairy Farmers' Co-Operative Ltd. in Ultimo, Sydney, with a capacity of 3,500 gallons of milk per hour for whole milk consumption and 3,000 gallons for separation. Rail-transported raw milk is pumped into holding vats, pasteurized, clarified, homogenized, and returned to the storage vats before it gravitates down to the fillers. A computerized process control system regulates the temperature, pressure, flow, and weight; this system was installed in 1972 by Foxboro (Australia) Ltd.

Carton fillers used in this plant are of U.S. origin: The Excello Pure-Pak XP and ZP types (6,000 and 8,000 units per hour, respectively) and the Haskon carton filler for larger units (2,000 units per hour). The pasteurizers were imported from Paasch & Silkeborg of Denmark, and the homogenizers were obtained from Ditta-Gino-Frau of Italy and Ranni Machine Works of Denmark.

Fruit and vegetable processing.—The total output in this industry rose from 450 million kg in 1971 to 470 million kg in 1973. Production of quick-frozen vegetables showed an increase of over 50% from 1971 (59.7 million kg) to 1973 (90.1 million kg). Canned or bottled vegetable output rose from 89 million kg in 1971 to 105 million kg in 1973; seasonal weather variations apparently caused preserved fruit output to fall from 301 million kg in 1971 to 274 million kg in 1973.

Enterprises with more than 100 employees account for approximately 70% to 80% of the total sales in this sector. While capital investment in the preserved fruit and vegetable sector amounted to $11.2 million in 1972, expansion (particularly by frozen vegetable manufacturers) raised the level to approximately $18.6 million in 1974.

One of the major companies in the fruit and vegetable processing sector is Petersville Australia Limited, a holding company for manufacturers, distributors, and exporters of a variety of food products; subsidiaries include Gordon Edgell Pty. Ltd. and

Birds Eye Foods (Australia) Ltd. Cottees General Foods Ltd. is another large food company with some interests in fruits and vegetables. Provincial Traders Holding Ltd. is the holding company for Frozen Foods Industries, and Henry Jones (IXL) Ltd. is a Melbourne-based food manufacturer with major interests in this sector. Wattie Pict Limited, a subsidiary of Allied Manufacturing and Trading Industries Limited (AMATIL), is a leading processor of fruits and vegetables.

H. J. Heinz Co. Australia Ltd., an American-owned food processor, is an important manufacturer of canned foods, soups, baby food, cereals, and wine. Subsidiaries include Epicure Continental Food Company Pty. Ltd. Campbell's Soups (Australia) Pty. Ltd. is also a major manufacturer of soups for the Australian market.

Cottees General Foods plans to build a frozen food plant with a liquid nitrogen freezing tunnel at a cost of $3.7 million. The new plant, expected to be completed in 1976, will process 55,000 lb potatoes per day (120-day season), 80,000 lb peas per day (60-day season), and 60,000 lb beans per day (90-day season).

Henry Jones (IXL) Ltd. plans to build a new tomato processing plant in 1975 to increase its capacity from 30,000 tons to 40,000 tons per season. This company also intends to buy new quickfreezing equipment at a cost of $149,000.

Although full automation does not appear to be realistic for many operations within the next 5 years, semiautomation is considered a definite necessity in this industry. Ease of maintenance, service, reliability, throughput capability, and versatility are the chief criteria by which new equipment is judged, and manufacturers are seeking new methods or new packaging materials to reduce costs. Fruit and vegetable processors look particularly to American manufacturers or to their subsidiaries or licensees in Australia for additions to their plants, since they consider U.S.-designed equipment technologically superior.

With annual growth rates of 8% to 12% predicted in this sector over the latter half of the 1970's, continuous introduction of new products is anticipated.

Cottees General Foods operates a recently renovated bean- and pea-processing plant in Blackburn, Victoria. The system used in this plant typifies the level of technology common in the fruit and vegetable processing industry. During the 52-day season, beans are processed at the rate of 80,000 lb per day. The beans are air cleaned and washed with U.S.-origin equipment, then cut, blanched, and water-cooled before being placed in a Frigoscandia Flofreeze freezing bed (supplied by Wildridge and Sinclair). The frozen product is packed by a form/fill/seal system supplied by Macpack (Australia) Pty. Ltd., a U.S.-owned firm. Washing equipment was supplied by Kelly & Lewis, representing Key Equipment Company (U.S.A.). Urschel Laboratories supplied the snippers.

Bakery products manufacturing.—The total quantity of bread produced in Australia in 1972 amounted to 814 million lb, as compared with 804 million in 1970. Cookies production in 1973 reached 255 million lb, up slightly from 250 million in 1971. In recent years the bakery sector has become dominated by a few major producers; approximately 75% of the total market is supplied by enterprises with more than 100 employees. The level of capital investment in the bakery products sector reached $16.7 million in 1972; the estimated level for 1974 was $22.5.

Among the leading companies in this sector is George Weston Foods Ltd., the holding company for the major bread manufacturer "Tip Top" and other subsidiaries—N. B. Love Industries Pty. Ltd., Westons Holdings (Australia) Pty. Ltd., and Watson Foods Holdings Pty. Ltd.—in flour milling, cookie, cake, and pastry manufacturing. Allied Mills Industries Ltd. is the holding company for "Buttercup" and "Home Pride" bread, with extensive interests also in flour milling as well as the manufacture of stockfeed, margarine, cake mixes, and edible oils. Major subsidiaries include Austral Bakeries Pty. Ltd., Mowbray Industries Ltd., and John Darling & Son. Bunge (Australia) Pty. Ltd. has interests in flour milling and stockfeed manufacture, as well as bread production; subsidiaries include Southern Mills Ltd. and Sunicrust Bakeries.

Arnotts Limited has a dominant share of the Australian cookie market. Subsidiaries include Arnotts Biscuits Pty. Ltd., Arnotts Snack Foods Pty. Ltd., Arnott-Brockhoff-Guest Pty. Ltd., and Sunshine Biscuits Pty. Ltd.

In a two-stage expansion program, Allied Mills Industries Ltd.-Buttercup Bakeries will double the capacity of its Sydney bakery in 1975 and spend $4.5 million in 1976 to continue its expansion.

New bread-processing methods used in Australia include a mechanically developed instant dough system and a new molding technique designed to improve the quality and shape of bread.

With consumption somewhat static, labor costs up, and prices controlled by state governments, bread manufacturers are seeking technological efficiency that will lead to cost reductions. Greater automation throughout the bakery industry is expected in the future. Current trends point toward continued expansion by the principal suppliers who can achieve economies of scale, and the elimination of the smaller ones who cannot.

A typical bakery is the one operated by Allied Mills Industries in Kirrawee, Sydney, with a capacity of 10,000 loaves of bread per hour. A new system installed by Baker Perkins (Australia) features an instant dough process achieved with high-speed mixers. After division and a 20-minute proofing period, the bread is shaped through W-formation molds and placed in a final proofing machine before baking. The process is fully automated from the divider through the wrapping. Baker Perkins also supplied the wrapping equipment, while Sterling Machinery supplied the ovens.

Sugar refining and confectionery manufacturing.—Australia is one of the largest sugar producers in the world, with an output of 2.75 million tons of raw sugar in 1972. That year, Australians consumed about 24% of the total domestic output. From 1970 to 1972, production of chocolates rose from 102 million tons to 117 million; cocoa went up from 10.7 million tons to 12.5 million; and production of other confections rose from 123 million tons to 130 million.

About 50% to 60% of the total production is accounted for by enterprises with more than 100 employees. The level of capital investment for the sector totaled an estimated $30-$35 million in 1974.

Cadbury-Schweppes Australia Pty. Ltd. is the major producer of confectionery products in Australia, and Rowntree Hoadley Ltd. is the second largest.

The Bundaberg Sugar Company Limited, located in Queensland, has large interests in sugar-cane milling and growing. Pioneer Sugar Mills Limited is another important sugar miller.

The largest group of sugar producers in Australia operates under the name "Growers' Co-Operative"; its members, located throughout northern Australia, account for more than 30% of the country's output.

The C.S.R. Limited, the major public company in the sugar industry with seven mills and about 20% of the market, refines raw sugar for the Queensland government, operates refineries in each mainland state, and manufacturers and distributes about 95% of the refined products used in Australia. The firm plans to spend $8.9 million in 1975 for factory improvements and expansion.

The sugar and confectionery sector has been subject to many mergers and acquisitions in recent years. Such activity is expected to decline, however, except perhaps in North Queensland. New sugar milling and refining enterprises are unlikely in the foreseeable future, since both processes are a virtual monopoly of the C.S.R. Co. under an arrangement with state and federal governments.

Fully automated methods of production are gaining acceptance in Australia among sugar and confectionery manufacturers. Computer-controlled systems are now used in sugar mills and refineries.

The system of packaging for retail distribution, however, is less well advanced. This currently is under review by the C.S.R. Co., which anticipates a possible shift from paper to plastic for retail packaging. If this change occurs, this company alone would provide a substantial market for forming and filling machines.

Reliability, availability of service, and versatility were cited by confectionery manufacturers as being the chief criteria by which new equipment is judged.

A typical confectionery manufacturing enterprise is Rowntree Hoadley's plant in Campbellfield, Victoria, which produces a wide range of confectionery products, including hard candies. The hard candy system was installed in 1966. A sugar dissolver liquefies granulated sugar to produce a syrup, to which glucose is added. Heat exchangers are used to boil down this substance to a mass, which is then colored and flavored. After being cooled, the mass is rotated by a batch former into a continuous rope, reduced to the proper diameter, and run through a forming head which cuts and forms pieces in the desired shape. After a setting process on a cooling belt, the candy goes by conveyer to form/fill/seal packaging machine. The system was manufactured by Hansella of Germany, represented by Richard Foot (Australia) Pty. Ltd.

Beverage manufacturing.—Substantial growth has occurred in all subsectors of the beverage industry in Australia. From 1970 through 1972, production of beer increased from 342 million gal to 366 million; soft drink output rose from 156 million gal to 188 million; winemaking went up from 33.4 million gal to 33.9 million; and liquor production rose from 6.1 million proof gal to 7.1.

The brewery, soft drink, liquor, and (to a lesser extent) wine industries are dominated by a few large manufacturers that account for 85% to 90% of total sales in the beverage sector; only 38 beverage firms had 100 employees or more as of 1969. Capital investment in the beverage industry has been from $49 million in 1972 to an estimated $73 million in 1974.

Among the major producers in the beverage industry is Carlton and United Breweries Ltd., the largest brewer in Australia, which operates throughout Victoria and Queensland. In addition to two subsidiaries of the same name in Queensland and Rockhampton, there is a third called Manufacturers Bottle Co. of Victoria Pty. Ltd. Tooth & Co. Ltd is the second largest brewer in Australia, controlling much of the New South Wales market; in addition to its own brand, the firm markets Resch's, D.A., and Blue Bow beer, produces soft drinks, and sells wines and liquor. Tooheys Ltd. is a large Sydney brewer marketing beer, wine, and liquor.

AMATIL is an important holding company with extensive interests in the food and beverage industries. Major beverage subsidiaries include Associated Products and Distribution Pty. Ltd., Coca-Cola Bottlers (Brisbane) Ltd. and (Northern Rivers) Ltd., Devondale Cream Pty. Ltd., Marchants Drinks (Victoria), and Courage Breweries Ltd. Cadbury-Schweppes Australia Ltd., through its subsidiary, markets the Tarax and Schweppes range of soft drinks. Coca-Cola Export Corporation, a U.S. company and a leading supplier of soft drinks to Australia, has a major subsidiary in Sydney, Coca-Cola Bottlers.

One company planning to expand in 1975 is Cadbury-Schweppes Australia Ltd., which will build a major soft drink plant at a total cost of more than $16 million. The four bottling and three canning lines of the plant will have a capacity of 30 million cases per year.

Tooth & Co. plans to build a new brewhouse in 1975 with a capacity of 16,000 hectoliters per day at a cost of approximately $3.7 million, excluding land. The company anticipates simultaneous construction of a new canning line costing $1.5 million and having a capacity of 1,200 cans per minute.

While the major beverage manufacturers are continuing to expand output as they forecast steady growth, few new enterprises are likely to be established because of high capital costs. Since 1972, however, major growth has occurred in the Australian wine industry, with many large companies acquiring interests and making large investments.

Many beverage manufacturers in Australia—particularly soft drink makers—utilize the most sophisticated processing and packaging equipment available. Brewers, on the other hand, prefer semiautomation for their more limited output, and the smaller companies are influenced more by price than by functional capability in buying their equipment. Both large brewers and soft drink manufacturers view the availability of spare parts and immediate service as most important in their purchase decisions.

Coca-Cola Bottlers (Sydney), which operates two plants at Kingsgrove and Vilawood, in 1972 installed a highly automated canning line with a capacity of 1,200 cans per minute. A computer controls the mixing of a syrup, sugar, and water solution, which is then pasteurized and heated at 180°F with the use of heat exchangers. Flavors and essences are added after the filtering, cooling, and storage processes. A metering device controls mixing with water, chilling, and carbonation. Can-filling and carbonating equipment items are of U.S. origin and were supplied by Meyer-Davleco Pty. Ltd. and Mojonnier Bros. of the United States.

Trade and Technical Regulations

Imported food processing equipment generally is subject to a duty rate of 41%. Some types of dairy equipment, including pasteurizers and cream separators, are imported at a lower rate.

The duty rate for most food packaging equipment is 6%. Bottling machines, however, have recently been subject to a 41% rate because a new domestic supplier has entered the market. At present, imports from British Commonwealth countries, including the United Kingdom, Canada, New Zealand, Papua, and New Guinea, receive preferential treatment (with duties one-half to two-thirds the usual rate), but this system is expected to be discontinued as a result of the United Kingdom's membership in the European Economic Community.

Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

Electricity is supplied in Australia at 240 volts, 50 hertz. Both the imperial and metric systems of weights and measures are currently used in Australia; by a 1970 law, the metric system is to replace the imperial entirely by 1980.

The Standards Association of Australia sets guidelines for technical standards to which imported equipment must conform, but the final decision on acceptability of equipment rests with the various state governments. The "Australian Standard 1210—Unfired pressure vessel code," introduced in January 1973, has required some modifications to U.S.-

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Australia to supplement this report is available on a continuing basis from:

Country Marketing Manager—Australia
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-2425

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in Australia," DIB 74-09-506, July 1974.

The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food Processing and Packaging Equipment—Australia" which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

origin food processing equipment. Australian trade sources suggest that American companies interested in exporting food processing equipment consult the various state Departments of Labour, Industry, and Health.

Information on the availability of published standards for food processing and packaging equipment in Australia may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

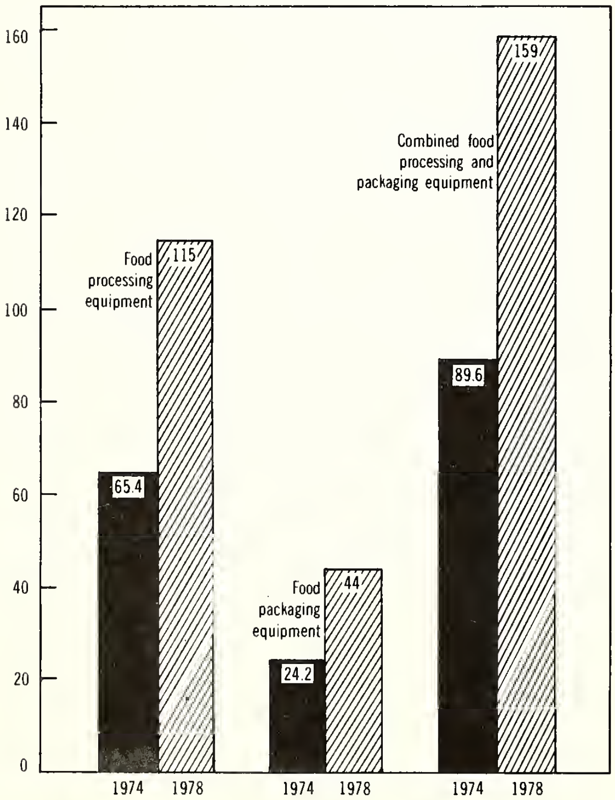
Brazil

Continuing improvements in living standards of the Brazilian population, coupled with a steady growth of the economy in general, are stimulating rapid expansion of the nation's processed foods industry. The industry's output is forecast to climb at a rate of roughly 15 to 17% annually during the next 4 years, and purchases of processing and packaging equipment should parallel this rate of growth.

The market for food processing and packaging equipment in Brazil is expected to approach $160 million [1] in 1978, up by an average yearly rate of more than 15% from the 1974 level of $90 million (see table 1). The market was valued at only $62 million in 1972.

Brazil: Food processing and packaging equipment market, 1974 and 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Brazilian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Sales of *food processing equipment* exceeded $65 million in 1974, having risen from less than $49 million in 1972. They are projected to total $115 million in 1978. Imports of food processing machinery were valued at $16.6 million in 1972, when, in addition to usual purchases, manufacturers of pasta and bakery products imported exceptional amounts of equipment. Following these unusual expenditures, imports dropped somewhat in 1973 but came back to register a total of $17 million in 1974. They are expected to grow more than 11% annually from 1974 to 1978, reaching $26 million in the latter year.

Brazilian imports of food processing equipment from the United States rose from $2.5 million in 1972 to $3.4 million in 1974. The American share of the import market is forecast to grow from its 20% level in 1974 to 22% (or $5.7 million) in 1978, at the expense of shares now held by Italy, France, Denmark, and Sweden.

The *food packaging equipment* market climbed from a $13-million level in 1972 to more than $24 million in 1974. It is expected to show a solid annual growth rate of more than 16% in the 1974–78 period, reaching a total of $44 million in the latter year. During this 4-year period, imports of food packaging machinery are forecast to grow from some $17 million to more than $31 million.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1 = Cr$5.25 (1971); Cr$5.93 (1972); Cr$6.12 (1973 and subsequent years).

Brazil—Economic Indicators
(1973)

Gross national product:	**$59.8 billion**
Total country imports:	**$ 6.86 billion**
Imports from U.S.:	**$ 1.89 billion**
Total country exports:	**$ 6.20 billion**
Exports to U.S.:	**$ 1.12 billion**
Population:	**103 million**

Imports of U.S.-made packaging equipment by Brazil's food industry rose sharply from $2.7 million in 1972 to $5.4 million in 1974. They are expected to exceed $11 million in 1978, based on a predicted increase of the American share of the industry's imports from about 32% in 1974 to 36% by 1978.

Competitive Environment

While approximately 30% of the Brazilian food industry's processing equipment needs are now supplied by foreign manufacturers, this share is expected to diminish somewhat in the future. On the other hand, foreign suppliers currently account for 70% of the industry's purchases of packaging machinery, and they are expected to maintain that share during the next several years.

The technological gap between locally produced and imported equipment is wide, leaving each with its distinct market. Domestically manufactured products are largely restricted to manually operated or semiautomatic equipment. Because equipment not duplicating items manufactured or capable of being manufactured in Brazil can usually be imported duty-free, foreign suppliers generally sell sophisticated items not yet produced in Brazil. A description of U.S. industry's competition in this market from both Brazilian and third-country suppliers follows.

Food processing equipment.—Brazilian manufacturers have proven themselves capable of supplying the majority of local processing equipment needs in the dairy and meat processing industries, about 50% of such needs in the bakery products industry, and a relatively small percentage in the beverage and fruit and vegetable processing industries. Although approximately 125 companies produce food processing machinery, only 10 to 15 firms manufacture on a large scale. It should be noted that through licensing agreements with major European and American manufacturers, domestic manufacturers are gaining increasing expertise that will enable them in time to expand their shares of the market.

The Brazilian Government provides strong incentives to local producers. These include high duties imposed on imported goods which could be duplicated by local manufacturers, exemption for locally manufactured equipment from the Merchandise Circulation Tax (ICM) and the Industrialized Products Tax (IPI), easy credit provided by the National Bank for Economic Development to purchasers of equipment produced domestically, and a Government-promoted "buy Brazilian" policy.

The Government has established further important incentives to encourage exports. Here are some examples: goods for export are exempt from the IPI and ICM taxes; manufacturers pay little or no tariff on imported raw materials, parts, or packaging materials needed to produce export items; and manufacturers receive an income tax exemption on profits from export sales.

Exports of food processing equipment amounted to only $1 million in 1973 but are expected to grow at an annual rate of 10% during the next 4 years. The bulk of exported equipment will probably go to neighboring countries.

Subsidiaries of foreign companies dominate the Brazilian food processing equipment industry. Among the most important of these are Separadores Alfa-Laval S.A., a Swedish subsidiary (manufacturing complete processing systems for the dairy, beverage, and animal/vegetable oil extraction industries); A.P.V. do Brasil S.A., Industria e Comercio, a United Kingdom subsidiary (complete processing systems for the dairy, fruit juice, and beverage industries); and Stork-Inox S.A., Industria e Comercio, whose parent company is Dutch (complete processing systems for the dairy products, beverage, and poultry industries).

Other subsidiaries include Siam-Util S.A., Industrias Mecanicas e Metalurgicas, whose parent com-

Table 1.—Brazil: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	8.3	9.8	18
Dairy	10.0	11.1	19
Fruit and vegetable	10.6	12.4	22
Bakery	8.8	8.5	15
Beverages	7.1	7.9	13
Other sectors	14.1	15.7	28
Subtotal	58.9	65.4	115
Food packaging equipment			
Forming, filling, sealing	11.1	12.6	23
Wrapping, packing	5.1	5.8	11
Marking, inspecting	3.0	3.4	6
Container/product/package prepartion and handling	2.1	2.4	4
Subtotal	21.3	24.2	44
Total food processing and packaging equipment	80.2	89.6	159

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Brazilian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Brazil: Imports of selected categories of food processing and packaging equipment by country of origin, 1971–73

	1971	1972	1973
Food Processing Equipment			
Dairy processing equipment			
United States	25	159	29
Germany	70	291	185
Switzerland	33	68	83
Netherlands	—	27	56
Others	54	139	142
Total	182	684	495
Grain milling equipment; machinery for processing dry vegetables			
United States	13	149	518
Switzerland	24	2	707
Germany	308	489	573
Italy	27	74	42
Others	146	183	234
Total	518	897	2,074
Bakery products manufacturing equipment			
United States	767	417	1,220
Germany	404	1,507	1,400
United Kingdom	1,582	1,872	102
Italy	32	185	32
Others	181	73	154
Total	2,966	4,054	2,908
Confectionery products manufacturing equipment			
United States	6	30	84
Germany	190	196	432
Netherlands	90	151	240
United Kingdom	3	629	177
Others	61	410	149
Total	350	1,416	1,082

	1971	1972	1973
Meat processing equipment			
United States	129	265	415
Germany	97	318	166
Italy	2	11	34
United Kingdom	—	11	22
Others	23	389	106
Total	251	994	743
Packaging Equipment [1]			
Cleaning and filling machines for bottles or other containers; packaging machinery (weighing up to 1,000 kg)			
United States	483	706	252
Germany	642	928	812
Italy	160	292	281
France	657	708	252
Others	557	760	1,597
Total	2,499	3,394	3,194
Cleaning and filling machines for bottles or other containers; packaging machinery (weighing 1,000 kg or more)			
United States	1,723	4,282	4,439
Germany	5,850	4,028	4,277
France	431	1,670	2,071
Argentina	188	1,154	1,578
Others	2,241	2,930	4,978
Total	10,433	14,064	17,343

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[1] Since Brazilian official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Brazilian trade sources to account for 53% of total packaging equipment imports in 1971 and 1972, and 55% in 1973.

Source: *Carteira de Comercio Exterior*, 1971–73.

pany is Argentine (bread and cookie machinery and refrigeration equipment) and Westfalia Separator do Brasil, Industria e Comercio de Centrifugas Ltda., a German-owned firm (buttermaking equipment, clarifiers, centrifuges, cream extractors, milk coolers, and other dairy machinery).

Tdo American-owned firms are AMF do Brasil S.A., Maquinas Automaticas (refrigeration equipment and filters), and FMC do Brasil S.A., Industria e Comercio (pumps, heat exchangers, and equipment for processing fruits and vegetables). A Danish subsidiary is Niro Atomizer, Instalacoes Industriais Ltda. (heating equipment, cookers, condensers, and spray-dry systems).

Three Brazilian-owned firms also are major processing equipment manufacturers. M. Dedini S.A. Metalurgica produces sugar-refining equipment, as well as autoclaves, evaporators, cookers, and filter presses for vegetable oil extraction. Industria Mecanica Inoxil Ltda. makes milk dehydration equipment, heat exchangers, centrifuges, and machinery for producing butter, cheese, yogurt, and ice cream. Treu S.A., Maquinas e Equipamentos, manufactures autoclaves, pumps, centrifuges, pulpers, evaporators, mixers, heat exchangers, and sifting machines.

Table 2 provides information on selected categories of imports from the United States and several other leading supplier countries for the years 1971–73. German companies, considered the most important third-country competitors of U.S. exporters to Brazil, held a 31 to 32% share of the food processing equipment import market over that time period.

German manufacturers share with the Americans a reputation for quality products in all types and classes of equipment. While the prices are considered comparable, German machinery is marketed aggressively through a large number of capable sales representatives and national manufacturers who also represent import lines.

Most European manufacturers maintain a greater number of sales outlets in Brazil than do American producers, and they regularly and successfully participate in trade fairs. For large-scale operations they often provide favorable financing terms. In addition, many foreign-affiliated food processing firms in Brazil import equipment from the countries of their parent companies, perhaps influenced by the availability of spare parts, compatibility with existing production techniques, and parent company specifications.

Some important third-country suppliers in the food processing equipment market are Holstein & Kappert Maschinenfabrik Phonix GmbH (equipment for the manufacture of dairy products), Otto Haensel GmbH (confectionery products), Westfalia Separator A.G. (dairy products), and Werner & Pfleiderer (bakery products), all of Germany; Tito Manzini and Figli (fruits and vegetables), of Italy; A.P.V. International Ltd. (brewery and dairy products) and Baker Perkins (bakery and confectionery products) of the United Kingdom; and Stork Amsterdam B.V. (dairy products) of the Netherlands.

Food packaging equipment.—German companies are also the chief competitors to U.S. suppliers in Brazil's market for food packaging equipment.

Major third-country manufacturers represented in the market include Cyklop Gesellschaft Emil Hoffman K.G., Otto Haensel GmbH, Robert Bosch GmbH, Werner & Pfleiderer, and Benz & Hilgers GmbH of Germany; O.T.E.M. of Italy; Akelund & Rausing and Tetra Pak International of Sweden; and Baker Perkins of the United Kingdom.

Brazil's food packaging equipment industry includes some 40 companies, but only seven of these are considered of major importance. Domestic production, which supplies approximately 30% of the food industry's packaging equipment needs, is expected to grow at an annual rate of about 15% through 1978. Although Brazilian exports of food packaging equipment are small at present, they are expected to increase about 10% annually between 1974 and 1978.

The most important producers of food packaging equipment in Brazil are foreign owned. Among them are subsidiaries of the German firms Robert Bosch, Maquinas de Embalagem Ltda. (filters for dry products, heat sealers, gluing equipment, form/fill/seal machinery for plastics, and shrink-wrappers); Otto Haensel, Equipamento Industriais Ltda. (cellophane and plastic wrappers, tubular wrappers, and shrink-wrappers); and Holstein & Kappert S.A., Industria de Maquinas (corking equipment, cappers, crimpers, labelers, and coding equipment).

Four major subsidiaries of American companies are Weldotron do Brasil, Sistemas de Embalagem Ltda. (machinery for stretch-film wrapping, shrink-wrappers, and bundlers); Companhia Universal de Fosforos e Embalagens (feeders and weight control and wrapping equipment); Crown Cork do Brasil S.A. (washing, bottling, and capping equipment); and FMC, Industria e Comercio Ltda. (cutting and sealing equipment).

Meteor, Industria e Comercio S.A., is a major Brazilian-owned firm which produces labelers, weight control equipment, filters for dry and paste products, and wrappers. Fabrima, Maquinas Automaticas Ltda., another locally owned firm, makes filters for dry and solid products, heat sealers, wrappers, and weight-control equipment.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find excellent opportunities for sales of the following types of equipment to the major sectors of the Brazilian food processing industry:

Food Processing Equipment

Fruit and vegetable.—Finishers/pulpers, dicing/cutting/chopping equipment, swept-surface heat exchangers, washing units, evaporators, and juice extractors.

Bakery.—Continuous breadmaking systems, bread slicers, continuous process ovens, cookie/cracker/wafer machines, and dough preparation equipment.

Beverages.—Carbonating and mixing equipment, concentration control equipment, and bottle fillers and cappers.

Dairy.—Cream separators, spray-driers, and evaporated/condensed milk equipment.

Meat.—Sausage-stuffing machines and evaporators for meat extracts.

Food Packaging Equipment

Forming, filling, sealing.—Vacuum and gas form/fill/seal systems, thermoformers, and can-making machinery.

Wrapping, packing.—Cartoners, bottle packers and unpackers, multipackers, horizontal wrappers, and shrink-wrappers and tunnels.

Container/product/package preparation and handling.—Bottle-washing equipment and box setup equipment.

The research survey indicates that the following U.S.-made products are also in strong demand in Brazil: quickfreezing equipment; crushing and milling equipment for grain products; equipment for making macaroni, spaghetti, and other pasta; and centrifuges for the sugar industry.

The Food Processing Industry

Brazilian food processing firms accounted for approximately $3.5 billion in sales in 1969, the latest year for which official statistics are available (see table 3). Nearly 470 enterprises in the industry had a net worth of at least $843,000 each in 1972 (see

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[2] Capital investments approved by the Industrial Development Council (CDI) for fiscal incentives, including all major projects.

table 4). CDI-approved capital investments[2] in the industry were $72.5 million in 1973.

Trade sources project that sales by the food industry in Brazil will rise at a rate of more than 16% a year, from an estimated $7.4 billion in 1974 to $13.6 billion in 1975, despite the Federal Government's price-fixing policy with respect to basic food products. This policy has had the effect of reducing some profit margins to levels so low that many food processors are forced to slow down or halt production until consumer price levels are raised.

The use of quickfreezing equipment by Brazilian food processors is not yet significant but is on the rise. Sales of quickfrozen food in 1972 were put at $10 million. The three firms currently utilizing quickfreeze apparatus limit their operations to processing fruits and vegetables, meat, and seafood for the institutional market. The outlook for these processors appears favorable, in that expansion into the export of fruits and vegetables is projected. Nearly all quickfreezing machinery is imported from Sweden and Denmark. Import value of such items for 1973 was estimated at $200,000, and it could reach $400,000 in 1975 and $560,000 in 1976.

A major problem affecting the entire food processing industry is the continuing shortage of tinplate, glass, plastic, and paper for packaging. In response to increasing consumer interest in modern merchandising practices, manufacturers have been eager to substitute plastic containers for the more traditional jars, cans, or paper containers. Although Brazil's petrochemical industries are expanding their capacity, demand should continue to outstrip supply into the 1980's; thus, imports from the unpredictable international market may be necessary.

Brazil's consumption of tinplate used for preserved fruits and vegetables, vegetable/cooking oils, preserved meats, beer, and fruit juice considerably exceeds its domestic tinplate production. As a result of this limited local capacity and the international shortages, some industries have had to switch to other packaging materials or have had to cut back production.

Processors of fruits in syrup, tomato extracts, and instant coffee have begun to use glass jars. Manufacturers of fruit jams and preserved fruits and vegetables greatly increased their production capacity from 1971 and 1973, and this precipitated a further run on glass containers. The glass industry in Brazil has not been able to keep up with the unexpected leap in demand because of a shortage of soda ash both locally and abroad. Domestic production of glass is expected to expand only with the opening of a new soda ash factory in northeastern Brazil in 1976.

Shortages have also affected the paper and cardboard packaging materials industry in Brazil, where demand is growing at a rate only slightly less than that for plastics. Cardboard boxes are used in almost all sectors of the food industry, and paper is widely used for packaging bakery products, sugar, flour, cereals and other breakfast foods, candies, and many specialty foods. Although Brazil is able to supply 90% of its timber needs, the international shortage of woodpulp in 1973 caused potential buyers to substitute plastic for some paper packaging needs. Brazil's inability to supply its needs for paper is, however, considered to be only short term.

Table 3.—Brazil: Basic data on food processing industry sectors, 1969

(values in millions of U.S. dollars)

Sector	Sales by manufacturing establishments	Production (in thousands of metric tons)
Meat and poultry (excluding eggs)	222.1	2,172.9[1]
Dairy (excluding fresh milk)	208.6	209.4
Fruit and vegetable	70.1	182.6
Grain	316.3	199.8
Bakery (excluding bread)	71.2	150.5
Sugar and confectionery	n.a.	4,216.0
Fats and oils	447.6	224.6
Beverages	289.8	2,452.3[2]
Fish and seafood	13.5	30.0
Miscellaneous food products	92.4	1,266.2

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[1] 1970 figure.

[2] In millions of liters.

Source: *Producao Industrial, 1969.*

The five food processing industry sectors discussed below are among the most important processing and packaging equipment markets in Brazil, and are considered to offer the best sales potential for U.S. exporters.

Fruit and vegetable processing.—The largest market for food processing and packaging machinery is expected to be the fruit and vegetable industry. The major producers of fruit pastes, fruits in syrup, dried fruit, tomato extract, preserved vegetables, and concentrated orange juice increased their output by 80% from 1970 to 1973 (from 267,000 MT to

Table 4.—Brazil: Number of large enterprises[1] in food processing industry sectors, 1972

Sector	Number
Meat, poultry, and eggs	53
Dairy	16
Fruit and vegetable	20
Grain	49
Bakery	7
Sugar and confectionery	164
Fats and oils	37
Beverages	66
Fish and seafood	39
Miscellaneous food products	18
Total	469

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[1] Companies with a net worth of $843,000 (Cr$5 million) or more in 1972.

Source: *Quem e Quem na Economia Brasileira,* 1973.

483,000 MT). Capital investments approved by the Industrial Development Board for the industry totaled $16.1 million in 1972 and another $6.6 million in 1973.

Three large companies account for almost two-thirds of the domestic output of processed fruit and vegetables. Companhia Industrial de Conservas Alimenticias, a locally owned firm, is the largest fruit and vegetable processor in Brazil, holding about 40% of the market. The company recently built a new plant, largely equipped with U.S.-origin machinery, in the state of Rio Grande do Sul and also reequipped its main plant in Sao Paulo.

The other leading companies are the Brazilian-owned Companhia Industrial e Mercantil Paoletti and Industrias Alimenticias Carlos de Britto (Peixe), each of which has about 13% of the market. Peixe, recently acquired by the Brascan group of Canada, foresees no major expansion plans until excess production capacity at the three existing plants is absorbed.

Paoletti plans to install equipment for processing pineapples and green peas in 1975 and 1976. The total cost is expected to reach $740,000, of which $500,000 is to be spent on processing machinery. Most of this equipment will probably be imported.

Although a number of the smaller fruit and vegetable processors have plans to expand, they rely primarily on manually operated or semi-automatic equipment and it therefore is likely that they will purchase from domestic manufacturers. Medium-size processors with highly distinct and short harvest seasons are tending to purchase fully automatic equipment from abroad.

The three largest producers of concentrated orange juice, who together supply 70% of the market, are Citrosuco Paulista S.A., Suco Citrico Cutrale S.A., annd Citrobrasil S.A. The remaining 30% is held by Sanderson do Brazil S.A., Frigorifico Avante S.A., Citral S.A., Seiva S.A., and Inducitros S.A. Most of these producers are located in the state of Sao Paulo. Although none of these companies has reported expansion programs, a number of new companies plan to enter the orange juice market soon.

No new or highly developed food processing or packaging methods are currently being utilized by these manufacturers. Except for the orange juice concentrate and tomato extract industries, which are directed toward export markets, management favors the use of batch machinery or general-purpose equipment. The limited size of the market requires that manufacturers utilize processing and packaging equipment for a variety of finished products in order to reach near-capacity production levels and to reduce per-unit costs.

Developments in the fruit and vegetable industry are expected to center on the market for frozen foods for export, the institutional market, and the use of spray-dried products. Mergers and acquisitions throughout the fruit and vegetable industry have increased, and there are reports that many large foreign corporations plan to enter the industry.

Representative of the systems used in this sector is the Paoletti tomato extract processing plant that was scheduled for completion in Sao Paulo by the end of 1974 at a total cost of $1.7 million. Over 80% of the $1 million earmarked for processing machinery was to be imported, most of it supplied by FMC Corporation of the United States. The plant's plans called for three lines, which together could handle an input of 72 MT of tomatoes per hour. The basic equipment included washers; roller conveyors; C.B. elevators; chopping machines; hot break tanks; pumps; pulpers; finishers; evaporators; heat exchanger systems; can-cleaning, washing, drying systems; fillers; cookers; and case sealing and handling systems.

Bakery products manufacturing.—The Brazilian bakery industry produced 2.3 million MT of bread in 1973, of which almost 2 million MT comprised French bread. The sandwich bread industry showed a 16% annual growth rate from 1969 through 1972; bread consumption as a whole, however, increased at only a 4.6% annual rate. Brazilian production of cookies and crackers rose from 150,000 MT in 1969 (worth $71 million in sales) to 220,000 MT in 1972—an approximate 13% annual increase in output for that period. Future growth is predicted to average some 10% annually over a period of several years.

French bread is supplied by numerous small bakeries; two large companies control more than 80% of the sandwich bread market of Sao Paulo and Rio de Janeiro. Two manufacturers of cookies and crackers account for 60% of the Sao Paulo-Rio market; four others supply another 32%. Government-approved capital investment in the bakery industry, which amounted to more than $16 million in 1973, was almost entirely concentrated in cookie and cracker businesses.

The largest sandwich bread producer is Pao Americano Industria e Comercio S.A. (Pullmann), located in Sao Paulo, which provides 46% of the combined Sao Paulo-Rio de Janeiro demand. Industrial Panificadora S.A. (Plusvita), in Rio de Janeiro, supplies 36% of the same market. Two other Sao Paulo firms, Lua Nova S.A. and Kelly Industria Brasileira de Panificacao Ltda., furnish 7% of the Sao Paulo-Rio market. The remaining 4% share is divided among a number of the larger district bakery shops in both cities. As yet, none of these bread producers has ties with holding companies or groups.

The six leading cookie and cracker makers provide 90% of the Sao Paulo-Rio de Janeiro market and about 80 to 85% of national production. The Industria de Produtos Alimenticios Confianca S.A. (Tostines) furnishes more than one-third of the market, and Industria de Produtos Alimenticios Piraque S.A., has a 25% share.

Another one-third of cookie-cracker sales in Sao Paulo and Rio de Janeiro is divided among four companies: Refinacoes de Milho Brazil Ltda. (Aymore), controlled by CPC International Inc. of the United States); Companhia Paulista de Alimentacao Duchen, controlled by the Brazilian-owned Grupo Fenicia/Arapua; Companhia Industrial Brasileira de Productos Alimenticios-Nestle (Sao Luiz), a subsidiary of the Swiss firm Nestle Alimentana A.G.; and S.A. Industrias Reunidas F. Matarazzo (Petybom). The remaining 8% of the Sao Paulo-Rio market is shared by a number of small regional companies.

The two largest sandwich bread producers had plans to expand between 1974 and 1976. Pao Americano will build two new plants in Brasilia and a third in the state of Parana, representing total investment of $1.3 million. About 60% of the funds will be used to purchase U.S.-origin continuous liquid-sponge and oven systems, coolers, conveyors, slicers, wrappers, and greasing equipment. Industrial Panificadora plans to invest about $800,000 to enlarge the capacity of its plant. About half of this will be spent for automatic mixers and high-speed wrappers and for installation of a new bread production line.

The larger Brazilian bakeries possess relatively new and sophisticated processing equipment. The Piraque cookie and cracker plant uses United Kingdom-origin, trispeed automatic cream-sandwich equipment with a capacity of 1,600 unit per minute, as well as Italian-origin automatic cellophane-wrapping machinery. The largest sandwich bread producer, Pao Americano, uses continuous-process ovens and automatic bread preparation equipment in its Sao Paulo plant. Many company managers are convinced that they need to automate processing and packaging lines, but those in enterprises making products with limited markets still prefer to purchase batch-type equipment.

Although bakery snack items are not yet widely consumed in Brazil, the recent success of individually wrapped cookies is believed to be an indicator of a large market potential in snacks. No large bakeries in Brazil yet produce cupcakes, doughnuts, or small pastries.

Few mergers or acquisitions in the cookies and cracker industry are expected in the near future. The extraordinary boom in the market for sandwich bread, however, is expected to attract new enterprises and many branch bakeries throughout the country.

Kelly operates a typical bakery in Sao Paulo that produces 17,500 bread rolls, 2,000 sandwich loaves, and 5,000 hamburger rolls per hour. The three operational lines were purchased in 1973 from Werner & Pfleiderer of Germany. The first two operations are fully automatic, while the hamburger-roll line is semiautomatic. The high-speed wrapping equipment was imported from AMF Incorporated of the United States.

The sandwich bread line uses doughmixing/dividing/rounding/proofing machines, fermentation units, shaping machines, a continuous-process oven, stainless steel conveyors, a cooling unit, bread-cutting machines, and high-speed wrappers.

Beverage manufacturing.—Production of beverages in Brazil rose from approximately 2.5 billion liters in 1969 to over 3.2 billion liters in 1972, with beer and soft drinks making up the bulk of the supply. Two breweries account for 85% of the beer sales, while three firms supply 80% of the soft drink market. CDI-approved capital investments, which totaled $12.4 million in 1973, were heavily concentrated in the soft drink and beer industries.

Companhia Cervejaria Brahma supplies some 45% of the Brazilian market for beer, and Companhia Antarctica Paulista has a 40% share. The remaining 15% of the market is divided among several other breweries, including Cervejarias Reunidas Skol-Caracu S.A., a subsidiary of Brascan Ltd. of Canada; Cervejaria Paraense-Cerpasa; Cervejaria Serramatte S.A.; Cervejaria Perola S.A.; and Companhia de Bebidas da Bahia-Cibeb.

The same two companies that dominate the beer industry, Brahma and Antarctica, share with the U.S. subsidiary, Coca-Cola Industrias Ltda., 80% of the soft-drink market, in which some 300 bottlers participate. The remaining 20% of the market is divided among Pepsi-Cola, Skol, Seven-up, Crush, and many small local bottlers.

Two subsidiaries of foreign companies—the American-owned Heublein, Industria e Comercio Ltd. and the Italian-owned Martini & Rossi S.A.—are leaders in the wine market. Smaller firms include Dreher S.A. Vinhos e Champanhes, Cooperativa Aurora Ltda., Champagne George Aubert S.A., Peterlongo S.A., and Companhia Monaco-Vicie. Two American-, one Canadian-, and two Italian-owned firms are the leading Brazilian liquor producers: Heublein and Seagers & Stock do Brazil S.A. (Glen Alden Corporation); Seagram Destilaria Continental S.A.; and Martini and Rossi S.A. and Ron Bacardi S.A.

Although there appear to be no current plans for expansion, a number of small- and medium-size beer and soft drink manufacturers are expected to enlarge to meet growing demand. Major soft drink and beer companies are moving toward fully automated bottling operations, while many regional bottlers are also tending to modernize their facilities with automatic equipment. Among wine producers and distillers, however, production has begun to outpace sales, and no expansion of facilities is now anticipated. Few new firms are expected to enter the beverage market, and some of the regional bottlers are expected to be absorbed by the industry leaders.

A typical soft drink manufacturing concern is the Pepsi-Cola Refrigerantes Ltda. bottling plant in Sao Paulo, which has a capacity of 20,000 cases of 24 bottles each per 8-hour day. The entire operation was installed in 1969. U.S.-origin equipment includes packers, unpackers, filler/cappers, and soakers, all manufactured by the U.S. firm George J. Meyer Manufacturing. The rest of the machinery, including cooling units and compressors, is of Brazilian origin.

Dairy products manufacturing.—The dairy industry produced about 7.4 billion liters of milk in 1974, compared to 7.1 billion liters in 1972. Almost 75% of the 1972 total was utilized as fresh milk; butter accounted for 12%; cheese for 7%; powdered milk, 6%; and ice cream and yogurt, the smallest but probably the fastest growing areas, 3%.

There were some 16 dairy products manufacturers with a net worth of at least $843,000 in 1972. CDI-approved investments in the dairy industry in 1972 totaled $12.6 million, of which 60% went into fresh milk operations, 39% into yogurt, and 1% into cheesemaking lines; they amounted to $11.9 million in 1973, with 92% earmarked for producing fresh milk and 8% for cheesemaking.

There are four international enterprises currently among the leading dairy producers in Brazil. The U.S. company, Standard Brands Inc., has three subsidiaries producing fresh and powdered milk: Leite Gloria Ltda., Leite Gloria do Nordeste S.A., and Produtos Alimenticios Fleischmann e Royal Ltda. General Foods Corporation makes ice cream and whipping cream through its subsidiary Kibon S.A. A subsidiary of the French company Boussois, Laticinios Pocos de Caldas S.A., manufactures yogurt, whipping cream, cheese, and butter. Nestle Alimentana A.G., whose parent company is Swiss, produces powdered milk, ice cream, and condensed milk through its subsidiaries Companhia Industrial e Comercial Brasileira de Produtos Alimentares and Companhia de Alimentos Chambourcy.

A major locally-owned producer of fresh milk, cheese, and yogurt is the Companhia Leco de Productos Alimenticios. Laticinios Mococa S.A. is one of the chief purveyors of fresh and powdered milk. Cooperative Central de Laticinios do Estado de Sao Paulo and Cooperativa Central dos Produtores de Leite also supply fresh milk, and Companhia Industrial e Comercial de Produtos Alimentares and Embare Industrias Alimenticias S.A. are important suppliers of the powdered type. Cheesemakers of note include Polenghi S.A. Industria Brasileira de Produtos Alimenticios, Laticinios Luna S.A., Frigorifico Renner S.A., and Laticinios Mantiqueira Ltda. Two yogurt manufacturers are Cooperative Central dos Produtores de Leite and Cooperative Central dos Produtores Rurais (CCPR). A major ice cream maker is Sociedade Algodoeira do Nordeste Brasileiro S.A.

While there appear to be no immediate plans for modernization or expansion within the dairy industry, producers of fresh milk, ice cream, and yogurt will probably make substantial investments in food packaging equipment.

New trends in processing techniques include the introduction of dairy products with a prolonged lifespan. 'Long-life" milk, which may be stored up to 6 months without refrigeration, is being marketed in Bahia by Alimba S.A. and in Guanabara by Cooperativa Central dos Produtores de Leite. Equipment for this type of milk production is provided by the Swedish firm of Tetra Pak International AB.

Three dairy companies are beginning to produce long-life yogurt in Sao Paulo and Rio de Janeiro with techniques provided by Alfa-Laval (Brazil) via the Swiss firm, Siegenthalor & Frohlich. This yogurt can be stored for 8 days without refrigeration or for up to 4 weeks at temperatures of 10°C.

Another trend in the Brazilian dairy industry is the use of new plastic packaging techniques for yogurt, ice cream, and cheese products.

Few mergers or new enterprises are anticipated, but many of the larger companies are expected to establish branches throughout the country. Because of low profit margins and Federal Government price supervision, dairy processors view price as a most important factor in the purchase of machinery; assistance in cost/benefit analysis therefore is a major promotional tool in this market.

A typical system used in the manufacture of dairy products is that of CCPR, which produces 1 million 150-gram plastic cups of yogurt each month. Alfa-Laval supplied equipment for the entire operation, exclusive of packaging machinery, in 1973. The process employs equilibrium tanks, a heat exchanger system; a vacuum pasteurization system; a homogenizer; cell retention unit; yeast, incubation, and intermediary tanks; and machinery for adding flavoring.

Meat and poultry processing.—Brazilian meat production until recently was hindered by government price controls and export limits. The industry grew less than 5% per year from 1970 to 1973, during which period total output of processed meat and poultry rose from 2.2 million MT to 2.5 million MT. With the relaxation of price controls and the increase in international demand, however, meat production is expected to grow rapidly.

The industry is heavily concentrated in beef processing, of which 88% is marketed in the form of fresh, chilled, or frozen beef, while the remaining 12% is processed as dried or canned beef or beef extracts. Approximately 70% of the total beef market in Brazil in supplied by five companies.

Pork ranks second to beef in quantity of production, with 287,500 MT produced in 1970 and 332,800 in 1973. Poultry production is the fastest growing sector of the meat industry, with a 10% annual rate of increase since 1970. Poultry output rose from 90,000 MT in 1970 to some 120,000 MT in 1973.

CDI-approved capital investments in 1972 totaled $4.5 million, of which 53% was directed toward beef production, 44% to poultry production, and 3% to sausage production. Of the 1973 investment figure of $10.2 million, 97% went to the beef industry.

Holding more than 20% of the total market, the leading beef processor in Brazil is Swift-Armour S.A. Industria e Comercio, whose parent company is Brascan Ltd. of Canada. Borden S.A. and Companhia de Alimentacao do Brasil (COMABRA), both subsidiaries of Frigorificos Argentinos S.A., have 18% shares each. Frigorificos Anglo S.A., whose parent company is the British firm Union International Company Ltd., supplies 8% of the market for beef, and Frigorifico Renner S.A. supplies 4%.

It is doubtful that new firms will enter the market, but existing companies probably will undertake significant expansion and modernization to meet increased demand. Because of government controls in the industry, most slaughterhouse equipment is purchased from domestic manufacturers at prices considerably lower than those of imports. The larger meat processing and canning operators favor fully automated operations, but the small meat packing companies tend to use manually operated or semiautomatic processing and packing machinery. A processing technique recently introduced is one that uses sealing equipment for packaging plastic-sealed cold cuts.

Indicative of operations in the meat industry is the Swift-Armour slaughterhouse and meat processing plant in Sao Paulo, which processes 900 head of cattle per day to produce a total of 43 MT of frozen cooked beef, 150,000 cans of corned beef, and 1 MT of prime export fillet. Most of the equipment was installed during 1969–71 and is of Brazilian origin. The only imported components of the packing operation are can-sealing equipment (from the United States), can-stuffers (France), and sausage-making equipment (German).

Trade and Technical Regulations

Brazil imposes duties ranging from 9 to 105% on the c.i.f. value of food processing and packaging equipment, with most rates averaging between 30 and 50%. Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

Electricity in Brazil is supplied at 220 volts, 60 herts, for light industrial purposes and 440 volts, 60 hertz, for heavier industrial purposes. The metric system of weights and measures is used throughout the country.

Food processing and packaging equipment imports are not usually subject to technical regulation in Brzail. General standards for production and use of all industrial equipment are supervised by the Brazilian Association for Technical Norms (Associacao Brasileira de Normas Tecnicas), Rua Marques de Itu, 88, Sao Paulo, S.P., Brasil.

Information on the availability of published standard for equipment in Brazil may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Brazil to supplement this report is available on a continuing basis from:

Country Marketing Manager—Brazil
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-5428

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

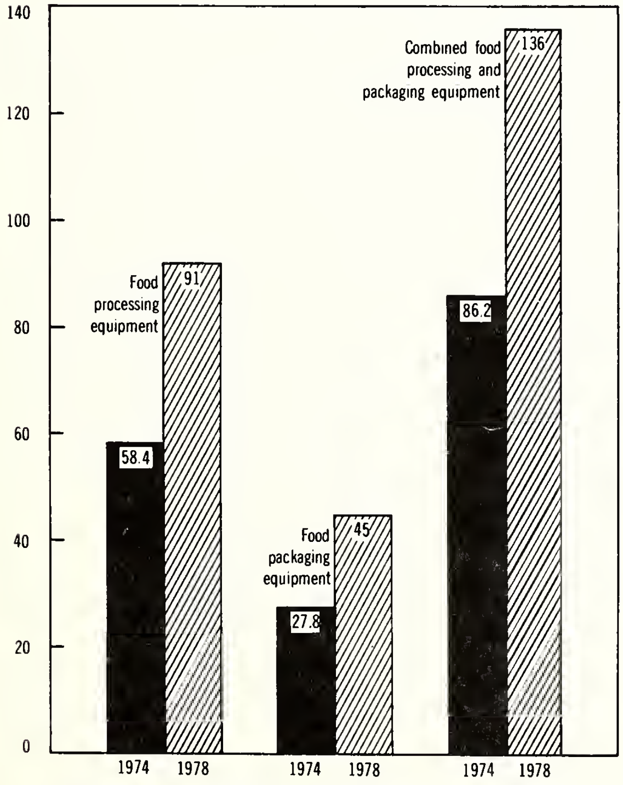
Please request: "The Market for Food Processing and Packaging Equipment in Brazil", DIB–74–12–504, August 1974.

Canada

Canadian food processors during the past 10 years have been steadily shifting away from small, labor-intensive plants toward larger, mechanized establishments and investing heavily in processing and packaging equipment. They spent more than $86 million[1] for such machinery in 1974, reflecting an average increase of 17.5% annually over their 1972 expenditures of $62.4 million. Sales are projected to rise 12.2% annually during the next 4 years, topping $136 million in 1978 (see table 1).

Canada: Food processing and packaging equipment market, 1974 and 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Canadian trade source estimates and projections of equipment purchases ultimately made by domestic end users.

Cost reduction has become increasingly important in the food industry, and *food processing equipment* that can speed up production while decreasing labor requirements is a practical necessity. Expenditures for processing machines and systems, which grew from $43.1 million in 1972 to $58.4 million in 1974, are expected to exceed $90 million in 1978.

Most of the demand is now filled by foreign manufacturers, who shipped food processing equipment valued at $49.3 million into Canada in 1974. The import market is forecast to climb at a 12.5% annual rate and to reach almost $80 million in 1978. As a result of the parallel development of Canadian and American food industries, U.S.-made equipment is often extremely well suited to Canadian production methods. U.S. manufacturers should continue to command more than 75% of this import market during the next 4 years.

Canadian purchases of *food packaging equipment* jumped from $19.4 million in 1972 to $27.8 million in 1974. The future development of this market will be influenced by several factors, including the imminent changeover to the metric system, shortages and rising costs of some packaging materials, and more rigorous government labeling regulations. Current projections place 1978 sales at the $45-million level, representing a 12.7% average annual growth rate between 1974 and 1978.

Foreign sources supply a substantial portion of the food packaging equipment market; imports amounted to $27.1 million in 1974 and are expected to exceed

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[1] All values are shown in U.S. dollars. Local currency data for all years are converted at the following exchange rate: US$1.00= Canadian $0.98.

Canada—Economic Indicators
(1973)

Gross national product:	**$121.1 billion**
Total country imports:	**$23.8 billion**
Imports from U.S.:	**$16.8 billion**
Total country exports:	**$25.7 billion**
Exports to U.S.:	**$17.4 billion**
Population:	**22.3 million**

$43 million in 1978. U.S.-made machinery should continue to account for approximately 85% of food packaging equipment imports through 1978.

Competitive Environment

Foreign manufacturers supply roughly 85% of the Canadian market for food processing equipment and 95% of the food packaging equipment market. U.S. industry's major competition comes from German firms. Recent data on Canada's equipment imports from the United States and other countries are given in table 2.

Canadian food processing and packaging equipment manufacturers are not expected to capture a larger segment of the domestic market in the near future. These firms are handicapped by a relatively small local market that does not encourage long production runs of a wide variety of specialized machines. Instead, they make a limited number of items for internal consumption and a growing export market. No Canadian manufacturer to date can offer systems such as complete packaging lines, whereas agents who represent a number of foreign suppliers can select from a wide range of equipment and build systems to meet the individual food processor's needs.

Table 1.—Canada: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	8.27	8.93	14.0
Dairy	9.09	9.81	15.3
Beverages	5.68	6.13	9.6
Grain	5.57	6.01	9.4
Miscellaneous food products	6.54	7.06	11.1
Other sectors	18.93	20.43	31.9
Subtotal	54.08	58.37	91.3
Food packaging equipment			
Forming, filling, sealing	9.86	11.70	18.9
Wrapping, packing	7.51	8.91	14.4
Marking, inspecting	4.69	5.57	9.0
Container/product/package preparation and handling	1.41	1.67	2.7
Subtotal	23.47	27.85	45.0
Total food processing and packaging equipment	77.55	86.22	136.3

Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Canadian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

A review of the third-country and Canadian competition faced by U.S. manufacturers in this market follows.

Food processing equipment.—U.S. suppliers account for the major share of Canadian imports of all but three categories of food processing equipment. European producers of dairy pasteurizers, confectionery manufacturing equipment, and fish processing equipment have an edge in these markets because their machinery is frequently better adapted to the production methods employed in Canada.

Important third-country suppliers of food processing equipment represented in Canada include Cepa (centrifuges) and Vemag-Verdener Maschinen (stuffing machines) of Germany, Wolfking (conveyors) and Lymgaard (meat curing equipment) of Denmark; and Alfa-Laval (heat exchangers) and Koppers (breading machinery) of Sweden. The Japanese firm, Mycom, sells refrigeration equipment in Canada, and Berkel of the Netherlands markets slicing machinery.

Forty Canadian firms manufacture food processing equipment, and together they supply roughly 15% of the country's needs. Domestic production, estimated at $12.3 million in 1974, has been expanding about 8% a year since 1971, and it is expected to maintain this growth rate through at least 1978. Exports have increased an average 9% annually since 1972, and no change in that rate of development is foreseen. Food processing equipment valued at $3.2 million was exported in 1974.

The major Canadian-owned manufacturers include Knud Simonsen Industries, which makes abattoir equipment and other meat processing machinery, and Kipp Kelly Limited, producer of dry-separating and -concentrating machinery for food processing and seed and grain cleaning. Well-established subsidiaries of U.S. firms include Patterson Industries (Canada) Limited (producing mixers, blenders, kneaders, kettles, agitators, and fluid processing units); Hobart Manufacturing Company Limited (food cutting and mixing machines), and Paul Mueller (Canada) Limited (stainless steel cookers). Toledo Scale, a subsidiary of Reliance Electric, manufactures blenders, slicers, mixers, and weighers; and The Bauer Bros. Co. (Canada) Ltd., of Combustion Engineering Inc., makes cookers.

Food packaging equipment.—U.S.-made packaging equipment is greatly preferred by Canada's food processors. Several other foreign firms sell to Canadian end-users, but only German manufacturers can be said to hold an important position in the market.

Pouch machines are sold by Thimmonier & Co. of France and Reichlin of Switzerland. Filling machines for solids, liquids, and powders are supplied by Aeite of the United Kingdom and Cotuplas of France, and shrink systems are marketed by Sirtha of Italy and Maschinenbau Aachen of Germany. Other important third-country suppliers include Thomas Hill of the United Kingdom (cleaning and washing machines), Anken of Germany (labeling, printing, and marking machines), and Donazzi of Italy (capping, lidding, and packing machines).

Domestic producers provide 5% of the Canadian food industry's requirements for packaging equipment. The 49 manufacturers, whose combined output has been increasing by about 18% annually since 1971, sell most of their products in Germany, France, and Italy. Production reached an estimated $6.6 million in 1974, and exports totaled $5.9 million. The Federal Government encourages the development of this industry by organizing trade shows in other countries and offering other trade promotion assistance.

Case packers are manufactured in Canada by Edson Packaging Machinery Ltd., H. J. Langen & Sons Ltd., and Pyramid Machine Works Ltd. Various types of fillers are produced by Purity Packaging Ltd. and H. G. Kalish Co. Ltd. Pallet-shrink and shrink-wrap equipment are made by Ideal Equipment Ltd., Michael Shulman Associates, and Wrap-O-Matic Co. Ltd. Packaging Automation Machinery Co. Ltd. makes overpacking machines and custom-built equipment; Haessler & Deway Ltd. manufactures bagging devices, leaflet-inserting apparatus, and end-load case packers; Caristrap Corporation producers strapping machines and tools for cord and polypropylene strapping; and Arpeco Engineering Co. Ltd. makes inspection slitter/rewinder machines.

Four U.S.-owned firms are among the major equipment manufacturers. Bonar & Bemis Ltd. makes heat-sealing equipment and coders; Canners Machinery Ltd., owned by Del Monte, produces hand-pack fillers and can washers; Delamere & Williams Co. Ltd., a subsidiary of Pneumatic Scale Corporation, manufactures pouch machines, volumetric fillers, packers, and tea bagging machines; and Phin Universal, a division of Stackpole Carbon Company, makes labeling machines.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, indicates that American manufacturers will find excellent opportunities for sales of the following types of equipment to the leading sectors of the Canadian food processing industry.

Food Processing Equipment

Meat, poultry, and egg.—Poultry defeathering and eviscerating machinery, frozen meat slicers/cubers, cooling/freezing equipment, and liquid nitrogen tunnel-freezers.

Dairy.—Spray-driers for preparation of powdered milk.

Beverages.—Presses and crushing machines for winemaking, and concentration control equipment for soft drink production.

Grain.—Sifting, washing, and cleaning machines; and magnetic separators.

Miscellaneous food products.—Coffee dehydration equipment.

Food Packaging Equipment

Forming, filling, sealing.—Thermoformers, fillers for both liquid and dry products, heat sealers, and vacuum form/fill/seal systems.

Wrapping, packing.—Shrink-wrappers and tunnels, cartoners, and multipackers.

Marking, inspecting.—Coding equipment for universal product code, checkweighers, and code-dating equipment.

Container/product/package preparation and handling.—Box setting-up equipment, palletizers, and stackers.

The research survey reveals that the following U.S.-made products also are in strong demand in Canada: fish filleting and scaling machines, and liquid nitrogen tunnel-freezers for the fruit and vegetable and seafood sectors.

The Food Processing Industry

Manufacturing establishments in Canada's food processing industry numbered 5,778 in 1970 (see table 3). Only 4% had more than 200 employees, but these firms accounted for 44% of the total output. The number of firms has been declining steadily and is expected to fall to about 4,000 in 1983, according to projections of *Food in Canada*. Industry sales meanwhile are expected to rise from $9.2 billion in 1971 (see table 4) to $12.3 billion in 1978 and $14.8 billion in 1983. The trends toward fewer and larger plants and toward higher production assure a growing market for modern food processing and packaging equipment.

Quickfreezing equipment has been used in Canada for many years, primarily in the fish, meat, and fruit and vegetable industries. Trade sources estimate that sales of such machinery, now ranging from $3.5 million to $4 million annually, will increase with the shift to larger, modernized plants. Quickfreeze tunnels are expected to replace the plate/blast freezer installations now in common use. At least one bakery has installed a tunnel for freezing bread dough.

The food industry as a whole spent $542 million for packaging materials in 1968, accounting for 36% of all such goods used in Canada. The beverage

Table 2.—Canada: Imports of selected categories of food processing and packaging equipment by country of origin, 1971–1973

(in thousands of U.S. dollars)

	1971	1972	1973
Food processing equipment			
Meat packing industry machinery and parts			
United States	3,944	4,229	5,611
Germany	346	294	439
Switzerland	76	154	73
Italy	86	71	67
Austria	72	74	—
Others	204	178	588
Total	4,728	5,000	6,778
Dairy plant machinery and parts, excluding pasteurizers			
United States	4,258	5,934	5,838
France	221	193	321
Sweden	121	206	159
United Kingdom	49	83	104
New Zealand	—	340	—
Others	181	176	339
Total	4,830	6,932	6,761
Flour and grist mill machinery and parts			
United States	2,870	2,881	3,577
Germany	104	202	281
Denmark	2	138	190
Others	218	253	535
Total	3,194	3,474	4,583
Bakery machinery and parts			
United States	3,473	3,216	4,731
Germany	244	608	403
United Kingdom	198	164	401
The Netherlands	211	314	267
Others	168	200	324
Total	4,294	4,502	6,126

	1971	1972	1973
Beverage industry machinery and parts			
United States	3,082	2,213	2,299
Germany	106	262	142
Italy	23	68	52
Others	48	39	82
Total	3,259	2,582	2,575
Packaging equipment[1]			
Bottle washing, filling machinery and parts			
United States	7,003	6,627	9,619
Germany	214	846	1,255
France	51	291	393
Others	84	201	134
Total	7,352	7,965	11,401
Can washing, filling machinery and parts			
United States	3,475	2,696	3,327
Germany	158	78	64
Others	124	143	73
Total	3,757	2,917	3,464
Wrapping, labeling machinery and parts			
United States	3,070	3,355	5,069
United Kingdom	485	254	570
Germany	120	236	538
Others	441	258	509
Total	4,116	4,103	6,686

sector, the largest food industry consumer, spent nearly $140 million, and the fruit and vegetable processing industry invested $115 million. The dairy and miscellaneous food products sectors each purchased packaging materials valued at $72 million.

Current shortages and rising prices of packaging materials will be of major importance in the selection of food packaging equipment. Though the most severe shortage is in plastics, long delivery times and quota systems now exist for paper, some metals, and foil. Shortages of soda ash may reduce the supply of glass in 1975.

The newest trends in packaging by Canada's food processors include the adoption of plastic packages for frozen and snack foods and the use of vacuum tear-out lids on metal cans have made them practical skin packaging to wrap beef and other fresh meat products at the packinghouse. Greatly improved for a wider range of products. Pouch packaging for liquids is one of the biggest growth areas in the food industry; the minipouch concept for fruit drinks has been introduced, and milk pouch packaging is expected to gain wide acceptance. Research is nearly completed on utilization of plastic bottles for soft drinks.

New federal regulations requiring accurate package weights, as well as the shift to the metric system, should increase demand for more sophisticated filling and weighing equipment. The introduction of the Universal Product Code and new government regulations calling for bilingual labeling and more stringent descriptions of container contents, including nutritional values, will affect the types of labeling equipment needed.

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[1] Since Canadian official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Canadian trade sources to account for 50% of total packaging equipment imports.

Source: *Statistics Canada: Imports by Commodities,* 1971 through 1973.

The five major sectors of Canada's food processing industry, selected on the basis of gross dollar value of shipments, are reviewed below.

Meat, poultry, and egg processing.—Sales by Canada's 555 meat, poultry, and egg processing establishments approached $2.5 billion in 1971. The 38 large firms (i.e., those with more than 200 employees) currently account for more than 50% of total sector sales. Capital investment reached $45 million in 1974, up 15% from the 1972 level of $39.1 million.

Total output of processed meats and poultry rose from 4.3 billion pounds (lb) in 1970 to 4.6 billion lb in 1972.

Canada Packers Limited, Burns Foods Limited, and Swift Canadian Co. Limited (a subsidiary of the U.S. firm) are the major companies in the Canadian meat business. Canada Packers is primarily concerned with packing-house products and byproducts, but they also process other foods. Their production units include 12 meat processing plants and 11 creameries and poultry stations, as well as a number of canneries and feed plants. They also have interests in several companies outside Canada. Altogether, Canada Packers had gross sales of $1.5 billion in the year ended March 30, 1974.

Burns Foods Limited grossed $543 million in 1973. This firm owns meatpacking plants and wholesale branches at 18 major sites and, through its subsidiaries, operates grocery branches, dairies, and ice cream plants. Some of Burns' wholly owned subsidiaries are Palm Dairies Ltd., Scott National Co. Ltd., Pool Packers Ltd., Glacier Food Services Ltd., Snow Crest Packers Ltd., Canadian Dressed Meats Ltd., Alberta Western Beef Co. Ltd., and Kitchener Packers Co. Ltd.

The worldwide need for protein, combined with Canada's capacity to produce beef, assures the future growth of this sector. At this time the meat industry is labor-intensive but with increased production, the demand for automatic processing equipment should rise. There is considerable debate in the industry concerning the possibility of centralizing meat-cutting by performing all butchering operations in the processing plant rather than in the less efficient retail store. If legislation is passed allowing meat products to be extended with vegetable protein, investment in related machinery will climb.

Table 3.—Canada: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1970*

Sector	Large	Medium	Small
Meat, poultry, and eggs	38	111	406
Dairy	22	128	730
Fruit and vegetable	21	57	194
Grain	7	39	794
Bakery	32	107	1,824
Sugar and confectionery	22	21	110
Fats and oils	—	7	3
Beverages	29	89	368
Fish and seafood	23	74	247
Miscellaneous food products	20	64	191

[1] Large = 200 or more employees
Medium = 50-199 employees
Small = 49 or fewer employees.

Source: *Canada: Type of Organization and Size of Establishments for Calendar Year 1970*, Statistics Canada, May 1974.

Dairy products manufacturing.—The Canadian dairy industry produced 7.6 billion lb of dairy products, including 461.8 million gallons (gal) of milk. Cheese production grew an average 8.2% annually between 1970 and 1972, climbing from 340.7 million to 398.7 million lb, and ice cream production increased an average 5.7% yearly, going from 46.2 million to 51.6 million gal. Just under 3% of the industry's 880 companies have more than 200 employees, and these large firms account for 25% of industry sales. Capital investment by dairy products manufacturers reached $42 million in 1974, reflecting an average annual increase of 4.5% over 1972 expenditures.

One of the larger enterprises, Silverwood Industries Limited, had gross sales of $189 million in 1973. The firm produces and distributes dairy products and citrus fruit juices, and it operates convenience stores in Ontario and western Canada. Its major subsidiaries are Valley Milk Ltd., Valley View Dairies Ltd., Londonderry Distributors Ltd., and Mac's Milk Ltd.

Another important producer, Dominion Dairies Limited, manufactures and distributes dairy products and juices in Ontario and Quebec. The company, which is controlled by Kraftco Corporation of the United States, had sales approaching $98 million in 1973. Other large companies in this sector are Borden's and Fraser Valley Milk Producers Association.

Since Canadian dairymen have found it necessary to diversify their product lines in order to remain competitive, smaller companies in this sector will continue to merge or be acquired by larger ones. More firms are expected to undertake the production of manufactured milk products (such as puddings) and to invest in the appropriate processing and packaging equipment.

Beverage manufacturing.—Beverage industry output grew from 688.5 million gallons (gal) in 1970 to 781.1 million gal in 1972, representing an annual rise of 6.5%. Breweries produced 394 million gal in 1972, and soft drink output totaled 290 million gal. The fastest growth is occurring among winemakers and distillers, who increased their output more than 15% annually between 1970 and 1972. Wine production reached nearly 16 million gal in 1972 and distilled liquors more than 81 million gal. The large companies, about 6% of the total of 486 firms, account for approximately 60% of the sector's sales. The entire beverage industry invested $76 million for capital goods in 1972 and $81 million in 1974.

Three companies dominate the brewing industry in Canada: Carling O'Keefe Limited, John Labatt Limited, and the Molson Companies Limited. Carling O'Keefe is essentially a holding company for firms engaged primarily in the brewing of ale, lager, and stout in Canada, the United States, and Ireland. Its major Canadian subsidiaries are the Carling Breweries Ltd., O'Keefe Brewing Co. Ltd., Calgary Brewing and Malting Co. Ltd., the Bennett Brewing Co. Ltd., Doran's Northern Ontario Breweries Ltd., and Jordan Valley Wines Ltd. The firm is in turn controlled by Rothmans, a cigarette company. Carling O'Keefe's gross sales reach $412 million in the year ended June 30, 1973.

John Labatt Limited, a large holding and management company, grossed $403 million in the year ended April 30, 1973. Its subsidiaries are engaged in brewing, the manufacture and sale of wine and carbonated beverages, the milling of flour and animal feeds, the processing and sale of consumer food products and chocolate confectionary, and food service operations. Its principal brewers include La Brasserie Labatt Ltd., Oland's Breweries Ltd., Bavarian Brewing Ltd., and Labatt's Breweries in Ontario, Manitoba, Alberta, Saskatchewan, and British Columbia. Winemakers affiliated with this company include Chateau-Cartier Wines Ltd., Chateau-Gai Wines Ltd., and Casabello Wines Ltd.

Molson Companies Limited, a highly diversified company, operates breweries throughout Canada. In July 1974 the company purchased the assets of Formosa Spring Breweries from Benson and Hedges to obtain additional brewing capacity. Gross sales in the year ended March 31, 1973 were $522 million for all subsidiaries and divisions, including those engaged in such non-food industries as construction, cartage and storage, hardware and building materials, and office supplies.

The Canadian distillery business has two major companies; Distillers Corporation-Seagrams Limited and Hiram Walker-Gooderham & Worts Limited. Seagrams is involved mainly in the production of distilled spirits and wines, which it makes worldwide. Gross sales for the year ended July 31, 1973 totaled nearly $1.7 billion. Its major Canadian distilling subsidiaries are Beaupre Distillery Ltd., International Wines and Spirits Ltd., Joseph E. Seagram & Sons Ltd., Seagram-Distillers (Ontario) Ltd., Thomas Adams Distilleries Ltd., Canadian Distillers Ltd., Atlantic Distillers Ltd., Duncan Harwood Distillers Ltd., Captain Morgan Rum Distillers Ltd., Myers Rum Ltd., G. H. Mumm & Cie, and Champagne Heidsieck Monopole Co.

Hiram Walker has plants in Canada, the United States, Argentina, and Scotland. Its major subsidiaries are Hiram Walker & Sons Ltd., Gooderham & Worts Ltd., Jas. Barclay & Co. Ltd., Corby Distilleries Ltd., Destilerias Hiram Walker & Sons (Argentina); and Hiram Walker & Sons Ltd. (Scotland).

Table 4.—Canada: Basic data on food processing industry sectors

(in millions of U.S. dollars)

Sector	Sales by manufacturing establishments (1971)	Production (1971)	Capital expenditures (1972)
Meat, poultry, and eggs ..	2,470	2,475	39
Dairy	1,493	1,503	39
Fruit and vegetable	579	592	22
Grain	921	923	21
Bakery	661	661	21
Sugar and confectionery ..	485	482	13
Fats and oils	139	140	4
Beverages	1,236	1,314	76
Fish and seafood	392	392	20
Miscellaneous food products	870	875	34

Source: *Private and Public Investment in Canada, Outlook 1974*, Statistics Canada.

The distribution of beer in Canada is controlled by the various provincial governments, and there is relatively little room for innovation in package sizes or marketing techniques. Distillers face a quite different situation in which the increasing development of self-service liquor stores encourages new and different packaging methods.

The Canadian soft drink market is dominated by the four major brands, Coca-Cola, Pepsi-Cola, Seven-Up, and Canada Dry, all produced by subsidiaries of U.S. companies. The major Canadian-owned firm, Crush International Limited, is growing through the acquisition of other soft drink manufactures. In 1973, Crush purchased a large independent company, Charles Wilson Ltd. of Toronto.

There is considerable controversy in the soft drink industry about such matters as large bottle sizes, returnable versus nonreturnable bottles, and the use of cans. Producers need flexible, reliable machinery that can maintain peak-season production loads and yet perform efficiently during periods of less demand.

Grain milling.—Each year, Canada exports some 366 million bushels (bu) of wheat and approximately 84 million bu of other grains such as oats, barley, rye, and rapeseed. Domestic consumption of milled grains reached 3.1 billion lb in 1970 and increased to 3.3 billion lb in 1972.

The large companies, roughly 1% of the 840 total in this sector, account for 25% of the sales volume. Capital expenditures by the grain milling industry rose from $20.8 million in 1972 to $24.5 million in 1974.

The major companies in this sector are Robin Hood Multifoods, Maple Leaf Milling, Ogilvie Flour Mills, and George Weston Limited. Maple Leaf Mills, with gross sales of $266 million in 1973, is primarily engaged in flour milling, operating grain elevators, and handling animal and poultry feeds and vegetable oils; subsidiaries make bakery products and process poultry. The firm owns seven flour mills in Canada and two additional mills in Haiti and Trinidad.

The 1973 sales of Robin Hood Multifoods totaled $112 million. This company, which is fully owned by International Multifoods Corp. of the United States, operates 20 plants across Canada.

The Ogilvie Flour Mills Company Limited, a subsidiary of John Labatt Ltd., had gross sales of approximately $155 million annually in the early 1970's. The company produces and sells flour, cereals and feeds, starch, gluten, and grocery products. Its numerous subsidiaries include Industrial Grain Products Ltd., Lake of the Woods Milling Co. Ltd., Catelli Ltd., Strathroy Flour Mills Ltd., Ault Milk Products Ltd., Seaforth Milling Co. Ltd., and Cal-Ed Poultry Farm Eggs.

One of the largest Canadian food producers, George Weston Limited, had gross sales in 1973 of $1.4 billion. Directly and through subsidiaries this firm mills grain; manufactures biscuits, bread, cereal, cakes, confections, and ice cream; produces packaging materials; and processes pulp and paper in the United States and Canada. Its principal wholly owned subsidiaries are McCarthy Milling Co. Ltd., Weston Bakeries Ltd., Bowes Co. Ltd., Weston Foods Ltd., McCormick's Ltd., Paulin Chambers Co. Ltd., Marven's Ltd., William Neilson Ltd., Willards Chocolates Ltd., Donlands Dairy Ltd., Eddy Paper Co. Ltd., Somerville Industries Ltd., and Westfair Foods Ltd.

Miscellaneous food products manufacturing.—Shipments of the major food products in this sector rose from 589 million lb in 1970 to 622 million lb in 1972. During this period, shipments of coffee increased from 118 million to 122 million lb; pasta, from 220 million to 248 million lb; peanut butter, from 52.7 million to 54.9 million lb; spices, from 22.5 million to 27 million lb; and tea, from 46 million to 48 million lb. Shipments of potato products declined from 130 million to 122 million lb. Large companies make up 7% of the 275 plants and account for 39% of the industry's total sales. Capital investment grew from $34.1 million in 1972 to $40 million in 1974.

The most important companies in this sector are subsidiaries of foreign firms, including General Foods, General Mills, Standard Brands, Kellogg, Kraft Foods, Thomas J. Lipton, and Safeway from the United States; Nestle of Switzerland; and Brooke Bond of the United Kingdom. These companies are continually improving and updating their products, but most of the research and development is done at the home office. The largest Canadian-owned company in this sector is Kelly, Douglas & Co. Ltd., a subsidiary of the George Weston group. Kelly, Douglas has two plants for processing coffee, tea, and peanut butter under the "Nabob" brand.

Trade and Technical Regulations

The general Canadian import tariff rates for food processing and packaging equipment range from 25 to 35%. However, customs duties on food-related machinery from the United States, which enjoys "most favored nation" status, range up to 15%. The United Kingdom and its associated Commonwealth countries, which share British Preferential Tariffs with Canada, pay import taxes of no more than 2.5% on equipment for the food industry. Some types of machinery may be admitted duty-free regardless of source if they are not available from domestic manufacturers.

Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

Canada currently uses the English system of weights and measures but is in the process of changing to the metric system. The characteristics of the electrical system are 60 hertz, 110/220, 115/130, and 120/240 volts. All electrical equipment used in Canada must meet standards set by the Canadian Standards Association, 178 Rexdale Boulevard, Rexdale, Ontario. Information on the availability of published standards for food processing and packaging equipment in Canada may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Canada to supplement this report is available on a continuing basis from:

Country Marketing Manager—Canada
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-3355

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

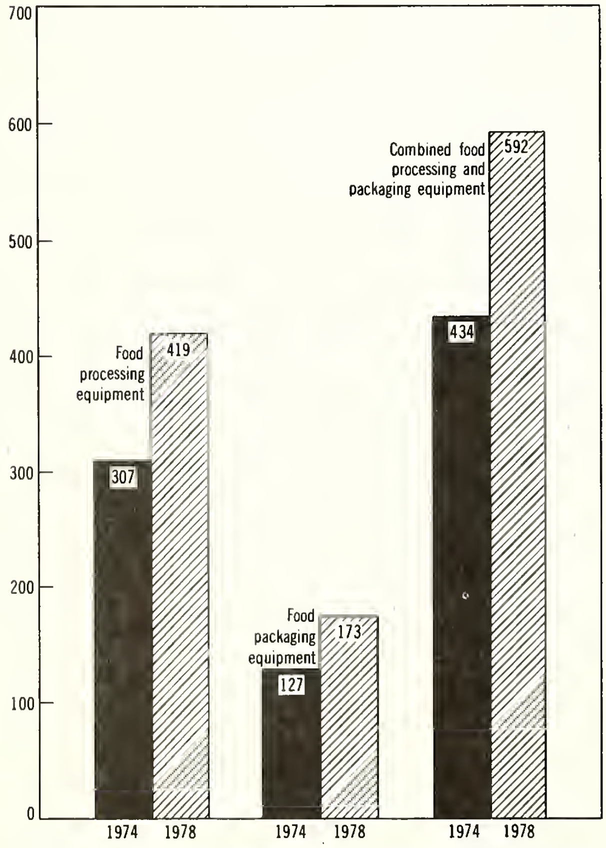
Please request: "The Market for Food Processing and Packaging Equipment in Canada", DIB–74–12–531, September 1974.

France

Sales of processed and packaged foods in France are rising sharply as French consumers do more of their shopping in supermarkets and buy less at small neighborhood shops. The country's food industry is increasing its purchases of food processing and packaging equipment to keep pace with this demand. Expenditures for such equipment accelerated by 50% from $293 million[1] in 1972 to $434 million in 1974. The food industry's outlays for both processing and packaging equipment are expected to climb by an average of 8% per year from 1974 to 1978, approaching a total of $600 million by the end of the 4-year period (see table 1).

France: Food processing and packaging equipment market, 1974 and 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research report. Values based on French trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Sales of *food processing equipment* alone rose from $213 million in 1972 to $307 million in 1974 and are expected to reach almost $420 million in 1978. Imports are expected to rise more rapidly than the market as a whole; purchases from foreign suppliers should increase by nearly 11% per year, totaling almost $140 million in 1978 compared with $92 million in 1974.

Mergers involving small and medium-size enterprises in the French food industry are creating units of production that can effectively utilize the more complex and higher capacity machinery offered by many foreign manufacturers. Imports of food processing equipment from the United States, which amounted to $4.8 million in 1974, are projected to more than double to almost $10 million in 1978, upping the American share of French food processing equipment imports from 5.2% to 7%. Even greater gains by U.S. exporters would result from a more active cultivation of the French market.

French industry purchases of *food packaging equipment* rose sharply from $80 million in 1972 to $127 million in 1974. The 1978 market is forecast to surpass $170 million. Imports are expected to approach $115 million in 1978, compared with $81 million in 1974. Partly because of French preference for American-made labelers and frozen convenience-food packaging equipment, U.S. manufacturers are likely to increase their share of the French food packaging equipment import market

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1 = FR 5.55 (1971); FR 5.04 (1972); FR 4.45 (1973 and subsequent years).

France—Economic Indicators
(1973)

Gross national product:	**$284.4 billion**
Total country imports:	**$37.2 billion**
Imports from U.S.:	**$3.1 billion**
Total country exports:	**$35.8 billion**
Exports to U.S.:	**$1.7 billion**
Population:	**51.8 million**

from $4.5 million (or 5.5%) in 1974 to more than $9 million (or 8%) in 1978.

Competitive Environment

Approximately 70% of the processing equipment presently purchased by the French food industry is obtained from local manufacturers. All but 35-40% of food packaging equipment, however, is imported. The domestic food processing and packaging equipment industry's share of the market is expected to decline gradually during the next few years but is unlikely to fall below 66% of total processing equipment sales and 33% of packaging equipment sales.

A profile of U.S. indusrty's competition from French and third-country suppliers active in this market follows.

Food processing equipment.—Roughly 200 companies—all but a few of them wholly French-owned—are involved in the production of food processing equipment in France. For many years these firms have been able to supply the domestic food industry with most of its machinery needs while at the same time cultivating export markets. Sales to foreign countries, mainly Algeria, Mozambique, and Brazil, totaled $18.9 million in 1972, up 33% from $14.2 million in 1971. Such sales are expected to climb steadily, in line with the growing consumption of processed foods in the developing nations.

Leading French manufacturers of food processing equipment include Pierre Guerin, Laguil Harre S.A., Simon Freres, and Alfa-Laval France (all making equipment for manufacturing dairy products); Bignier Schmidt Laurent (dairy products and beverages); Gondard S.A. and F. Hanau S.A. (bakery and confectionery products); Manufacture de Machines du Haut Rhin, known as Manurhin S.A. (meats); and Hobart Cie. (bakery products, meats, and fats and oils).

Germany and Italy are the two most important foreign suppliers of food processing equipment to France; their respective shares of 1972 imports were 36% and 14% (see table 2 for import data on selected categories of equipment). German equipment producers have long enjoyed a reputation for quality machinery, but their prices have risen sharply in recent years. While Italian manufacturers can sell standard types of food processing equipment to France more cheaply than either U.S. or German manufacturers, buyers note a difference in quality and durability. Recently, moreover, the Italian position in the market has been successfully challenged by Spanish producers.

According to official 1972 data on food processing equipment imports, the Netherlands, Belgium, the United Kingdom, and Switzerland rank behind Germany and Italy and ahead of the United States in shipments to France. The machinery made in these countries is considered by French customers to be of medium quality and moderate price.

Major European suppliers of food processing equipment to France include Kramer & Grebe K.G. (meat processing equipment), Lubeca Maschinen und Anlagen (fish), and Scheid Ludwig K.G. of Germany; Valati Officine (meat), Sirago-Ocrim (grain milling), and Ricciarelli Garibaldo S.a.s. (miscellaneous food products) of Italy; Goudsche N.V. Machinenfabriek (fruit and vegetable), Zephyr, and Rijkaart N.V. of the Netherlands; Jac (bakery products) and Grace S.A. of Belgium; Mather & Platt Ltd. (meat and dairy products) and A.P.V. Bowser Filtration Ltd. (beverages) of the United Kingdom; Alpina (fruit and vegetable), Artoflex, Eaton Corporation, and Hoegger and Cie S.A. of Switzerland; and Atlas A/S, Bog Jorgensens R. Maskinfabrik A/S, and Paasch & Silkeborg A/S of Denmark.

Table1.—France: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	44.5	47.0	59
Dairy	64.3	68.3	82
Bakery	41.5	44.0	57
Sugar and confectionery	36.8	39.0	59
Beverages	25.2	28.0	36
Other sectors	71.7	80.7	126
Subtotal	284.0	307.0	419
Food packaging equipment			
Forming, filling, sealing	29.5	30.5	40
Wrapping, packing	26.0	29.2	43
Marking, inspecting	46.0	48.3	62
Container/product/package preparation and handling	16.5	19.0	28
Subtotal	118.0	127.0	173
Total food processing and packaging equipment	402.0	434.0	592

Source: Bureau of International Commerce, Office of International Marketing research report. Values based on French trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—France: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-73

(in thousands of U.S. dollars)

	1971	1972	1973
Food processing equipment			
Dryers for the food processing industry including tobacco) [1]			
United States	—	9	54
Switzerland	17	—	328
Belgium-Luxembourg	—	—	110
Norway	—	67	72
Others	263	807	76
Total	280	883	640
Heating and cooking apparatus for the dairy industry			
United States	206	369	339
The Netherlands	768	1,865	1,916
Germany	113	564	181
United Kingdom	28	218	165
Others	267	417	464
Total	1,382	3,433	3,065
Heating and cooking equipment for the confectionery industry			
United States	100	277	—
United Kingdom	28	247	214
Germany	183	207	171
Italy	46	237	116
Others	235	41	168
Total	592	1,009	669
Other heating and cooking equipment for the food industry			
United States	1,344	374	164
Germany	1,528	1,474	1,945
Italy	367	543	690
The Netherlands	1,223	921	343
Others	1,305	740	1,116
Total	5,767	4,052	4,258
Machines and apparatus for the processing of grain			
United States	152	102	57
Germany	201	200	136
Switzerland	96	102	51
Italy	29	53	—
Others	33	48	121
Total	511	505	365
Machinery and apparatus for the processing of meat			
United States	398	650	1,457
Germany	3,180	3,767	4,900
Italy	652	729	840
Switzerland	491	481	560
Others	2,427	1,799	2,780
Total	7,148	7,426	10,537
Food processing machinery other than that for the grain, bakery, confectionery, sugar, and meat industries			
United States	—	—	592
Germany	803	131	2,158
Italy	38	—	525
Belgium-Luxembourg	89	120	440
Others	9	13	986
Total	939	264	4,701
Electric ovens, industrial and laboratory [1]			
United States	895	515	1,796
Germany	1,002	1,376	2,063
Italy	430	1,026	1,924
United Kingdom	98	80	357
Others	1,014	796	950
Total	3,439	3,793	7,090
Packaging equipment [2]			
Machinery for cleaning and drying containers			
United States	95	140	60
Germany	1,220	1,575	1,983
Italy	92	198	644
Switzerland	28	42	348
Others	750	917	400
Total	2,185	2,872	3,435
Machinery for filling, closing, and labeling bottles			
United States	1,337	1,286	1,609
Germany	7,810	1,003	11,323
Italy	2,284	3,473	3,304
Switzerland	736	1,085	1,152
Others	2,930	3,936	4,770
Total	15,097	10,783	22,158
Packaging, forming, and closing machinery			
United States	654	652	447
Germany	4,080	5,226	5,233
Sweden	789	1,864	1,262
Italy	1,181	961	564
Others	2,176	1,672	5,522
Total	8,880	10,375	13,028
Other packaging machinery			
United States	1,102	1,876	2,963
Germany	6,515	9,192	16,996
Italy	1,974	2,164	3,832
Switzerland	1,453	1,765	3,062
Others	3,499	3,719	5,513
Total	14,543	18,716	32,366

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[1] Since French official trade statistics do not differentiate between processing equipment for food and non-food uses in this equipment category, both types of equipment are included in these figures.

[2] Since French official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by French trade sources to account for 80% of total packaging equipment imports.

Source: *Statistiques du Commerce Exterieur de la France*, 1971-73.

Food packaging equipment.—As in the case of food processing equipment, Germany and Italy are by far the largest foreign suppliers of food packaging equipment to France. German-made machinery, which accounts for nearly 60% of imports, is preferred for complex tasks as well as for those in which high-speed operation is important. Simpler machines of Italian manufacture are favored for reasons of price. Italy supplies approximately 20% of French imports of food packaging machinery.

Among the leading European suppliers of packaging equipment to French food processors are Verpackings-Automaten of Germany, Carazza Natalino and Cornelius Italiana of Italy, Tetra Pak International AB of Sweden, Tee Pak International of the Netherlands, De Vree of Belgium, Industrias Roure and Somme S.A. of Spain, and A.P.V. Bowser Filtration Ltd. of the United Kingdom.

The approximately 75 French producers of food packaging machinery supply only about 35-40% of domestic requirements for such equipment. The industry's exports, however, are substantial. Shipments abroad were valued at $29.1 million in 1971 and $33.6 million in 1972. Developing nations, the principal customers, are expected to provide opportunities for relatively slow but steady gains in export sales during the next several years.

Among the important manufacturers of food packaging equipment in France are Remy & Cie. (filling and weighing equipment), Aucouturier (overwrapping equipment), La Main d'Oeuvre Mecanique (filling and closing machines), Plastimecanique S.A. (thermoformers and filling machines), and Virey et Garnier (labeling equipment).

Sales Opportunities

A market research study recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find favorable opportunities for sales of the following types of equipment to the major sectors of the French food processing industry.

Table 3.—France: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1970*

Sector	Large	Medium	Small
Meat, poultry, and eggs	9	18	1,828
Dairy	87	336	3,669
Fruit and vegetable	34	101	525
Grain	1	10	357
Bakery	50	155	55,128
Sugar and confectionery	69	141	1,229
Fats and oils	11	29	436
Beverages	46	212	7,263
Fish and seafood	18	80	199
Miscellaneous food products	8	58	1,337

[1] Large=201 or more employees.
Medium=50-200 employees.
Small=49 or fewer employees.

Source: French Ministry of Economics and Finance.

Food Processing Equipment

Meat, poultry, and eggs.—Boning machines, power cleavers, sausage-stuffing machines, frozen meat flakers/slicers/cubers, poultry defeathering and eviscerating apparatus, cooling/freezing equipment, beaters and tenderizers, and gutting machines.

Dairy.—Cheesemaking machines; homogenizers; spray-driers for powdered milk preparation; pasteurizers; ice cream preparation, freezing, cutting, and coating equipment; centrifugal cream extractors; and milk irradiators.

Bakery.—Pie machines; freezing equipment; continuous-process ovens; dough-mixing, -kneading, -dividing, -rounding, -proofing machines; enrobing machines; shaping machines; and breadmaking machines.

Sugar and confectionery.—Diffusing apparatus including calorizators, filter presses, crushing machines, comminuting equipment, and tabletting machines.

Beverages.—Filtering machinery, concentration control equipment, and carbonating equipment for making soft drinks, flavoring extracts, and syrups; rectifying plants and pumps for breweries and distilleries; and disintegrating machines and crumbling machines for wineries.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquids, viscous products, dry products, and solids; cutting, slitting, and trimming equipment; vacuum thermoformers; gluing equipment; and vacuum, gas, and aerosol form/fill/seal systems.

Wrapping, packing.—Overwrap wrappers, direct wrappers, multipackers, bundlers, and other packing equipment.

Marking, inspecting.—Labelers, coding equipment, check-weighers, can wrappers, code/label inspecting equipment, weighers, and metal detection equipment.

Container/product/package preparation and handling.—Unscramblers, box setting-up equipment, palletizers, aligners, accumulators, container vibrators, and feeding/orienting equipment.

The survey also indicates that all types of U.S.-made processing and packaging equipment for frozen foods are in strong demand in France.

The Food Processing Industry

The 10 major sectors of France's food processing industry include a total of 333 companies with more than 200 employees, 1,140 with 50-200 employees, and nearly 72,000 enterprises employing fewer than 50 percent (see table 3). Small- and medium-size firms are particularly important in the bakery products and meat and poultry processing sectors.

Though relatively few food processors have fully automated production lines, most companies are preparing for an eventual move in that direction. Progress in further modernization of processing methods has been slowed by social and political pressure to maintain traditional personnel management practices. For the next few years, businessmen in the food industry will be primarily concerned with selecting machinery that is both efficient, to minimize waste of increasingly costly raw materials, and flexible, to enable its use in processing or packaging several different products.

Because many French households were without refrigerators until the 1960's, daily shopping for food was part of the French way of life. By 1971, however, 80% of French homes were equipped with refrigerators and 16% with freezers. Frozen foods—particularly vegetables, seafood, and precooked dinners—are now widely accepted, and demand is growing steadily. The food industry is believed to have spent $105 million for deep-freeze and quick-freeze equipment in 1973.

Plastics are gradually replacing glass and paper in the packaging of food in France. The soaring cost of almost every type of packaging material, however, is causing manufacturers of some foods to completely omit overwraps and other "cosmetic" packaging, at least for the time being. Glass is still the material of choice for the beverage industry; aluminum cans have met with only limited success in the beer and soft drink markets.

Profiles of the five most important sectors of the French food processing industry are presented below.

Meat and poultry processing.—Output in the French meat and poultry processing industry expanded by 24% between 1970 and 1973, totaling 5 million tons in the latter year (see table 4). Beef production increased from 3 million to 3.7 million tons in the same 3-year period; poultry production rose from 700,000 to 900,000 tons; and pork output grew from 333,000 to 400,000 tons. Frozen meats account for a growing share of total production.

Firms employing more than 200 workers accounted for approximately one-third of total sales. Two holding companies—Olida & Caby, and Societe Geo—control a number of the meat industry's most important producers.

Pien et Glasson Ets. at Lisieux, considered a typical establishment, processes 50,000 tons of canned and frozen meat per year. The equipment used by the firm is primarily French (Jarvis), German (Beck and Heinkle), and American (Cryovac).

Table 4.—France: Production by food processing industry sectors, 1973

Sector	Production
Meat and poultry	5 million tons
Dairy products (milk and cream)	193.4 billion liters
Fruit and vegetable	536 thousand tons
Grain	14 thousand tons
Bakery	680 thousand tons
Sugar and confectionery	445 thousand tons
Fats and oils	490 million liters
Beverages	10.7 billion liters
Fish and seafood	190 thousand tons
Miscellaneous food products	1.5 million tons

Source: *Emballages*, December 1973.

The general trends at this plant, as in the industry as a whole, are toward more rapid and efficient processing methods and the replacement of paper packaging with plastics.

Dairy products manufacturing.—Dairy production in France rose slightly during 1970-1973, as was evidenced by the increase in total output of milk and cream from 182.4 billion to 193.4 billion liters. A breakdown of 1973 production shows 2.3 billion liters of fluid milk and cream, 101 billion liters of evaporated milk, and 90.1 billion liters of sweetened condensed milk.

Firms employing more than 200 workers accounted for 80% of dairy products sales. Major holding companies include Co. Gervais Danone, controlling three large firms, and Yoplait, which owns eight companies.

A typical processing system is located at the Andre Senoble Company in Jouy, Yonne. This medium-size producer has a yearly output of 50 million liters, of which 40% is milk, 10% butter, and 50% cheese. Many French dairies are modernizing rapidly, and Andre Senoble has plans to purchase a new high-temperature system for milk processing and to install several new cheese-processing lines.

Bakery products manufacturing.—Small- and medium-size enterprises dominate this sector of the French food processing industry, one reason being the French custom of buying fresh bread daily. Only 5% of the bread sold in France is prepackaged. The 50 large firms, however, accounted for 60% of the 680,000 tons of crackers, cookies, pastries, and packaged bread produced in 1973. Two of the largest corporate groups in the industry are Generale de Panification and Lu Brun & Associes. There is a noticeable trend toward mergers among the smaller and medium-size firms.

Jacquet S.A. supplies roughly 70% of the prepackaged bread sold in France. Their plant in Bezons produces approximately 100,000 tons per year. The equipment, most of which was installed 5 to 10 years ago, was supplied mainly by Werner

& Pfleiderer and Fr. Winkler K.G., both of Germany, and Rose Forgrove Ltd. of the United Kingdom.

Makers of baked goods are eager to see demonstrations of efficient, high-speed equipment. They are especially interested in new materials and techniques for wrapping pastries, cookies, and the newly popular frozen bakery products.

Sugar refining and confectionery manufacturing.—French industry produced 45,000 tons of refined sugar and 400,000 tons of confectionery products in 1973, representing increases of 25% and 16%, respectively, over 1970 output.

Production is concentrated in very few hands; less than 5% of the total number of manufacturers account for approximately 94% of sugar and confectionery industry sales. The major holding companies in the sugar refining industry are F. Beghin-Say S.A. and Generale Sucriere. Poulain et Cie., whose holdings include Poulain, Suchard, and Tobler, is the leading company engaged in confectionery making.

Poulain's factory in Blois has a daily output of over 145 tons: 60 tons of chocolate bars, 60 tons of powdered breakfast drinks, 12-15 tons of sugar candy, and 15-18 tons of chocolate candy. The company's semiautomated production system includes both very new equipment and machinery that was installed 20 years ago. Some operations are still performed by hand.

Beverage manufacturing.—Producers of wines, liquors, beer, soft drinks, syrups, fruit juices, mineral water, and cider reported a total output of 10.7 billion liters in 1973, 15% more than the 9.3 billion liters produced in 1970. During that period, wine production rose from 4.5 billion to 4.9 billion liters, beer output from 2 billion to 2.3 billion liters, and soft drinks from 890 million to 1.6 billion liters.

Large firms, such as the Dubonnet-Cinzano-Byrrh (aperitifs) and Damoy (wines) groups, accounted for 90% of output.

The Damoy winery at Ivry-sur-Seine produces over 1 million liters annually; the equipment used is primarily French (Gasquet, Daubron, and Brauthite), German (Kettner and Holstein & Kappert), or Belgian (Dubru). Many important components of their production systems are quite new; some were installed in 1974. Damoy, like other French beverage manufacturers, is attempting to achieve much greater precision in its beverage processing and higher speeds in its bottling operations.

Trade and Technical Regulations

Customs duties applicable to food processing and packaging equipment entering France from the United States range from 5% to 10%, with tariffs on most items falling between 5% and 6.5%. These rates are higher than those applicable to imports from most European countries, particularly member nations of the European Economic Community, which enjoy duty-free status. A tax of 20% assessed on the duty-paid c.i.f. value is levied on all imports to compensate for value-added taxes placed on domestic goods at each stage of the production process.

Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

The characteristics of France's electrical power supply are 220 volts, 50 hertz. However, many factories use 380-volt, 3-phase current. The metric system of weights and measures is the statutory standard in France.

Information on the availability of published standards for food processing and packaging equipment in France may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on France to supplement this report is available on a continuing basis from:

Country Marketing Manager—France
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-4504

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in France," DIB-74-12-502, May 1974.

The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food Processing and Packaging Equipment—France" which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

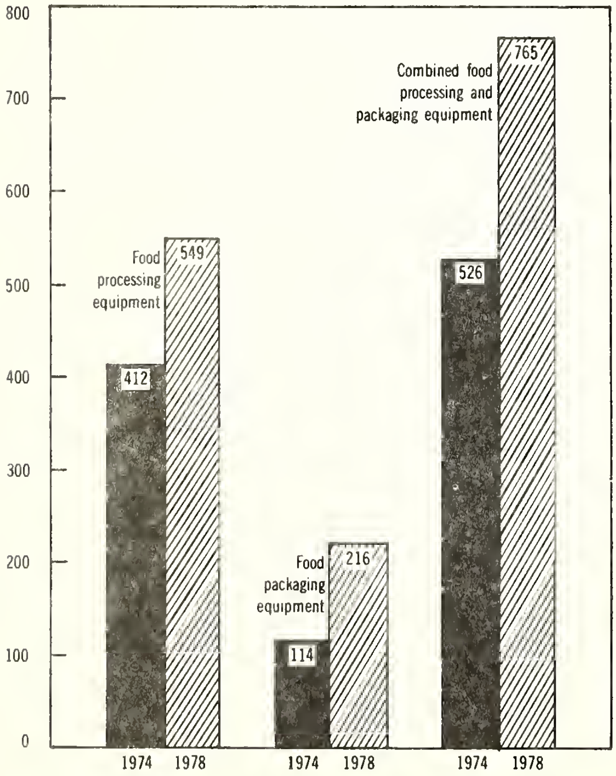
Germany

Germany is one of the world's largest markets for food processing and packaging equipment. Sales of such machinery in 1974 totaled $526 million,[1] almost 30% above the 1972 level of $411 million. The market is expected to expand by nearly 10% annually during the next 4 years, reaching $765 million in 1978 (see table 1).

German consumers are spending more than ever before for processed foods and beverages; a major reason is the appeal of recently introduced convenience, snack and dietetic foods. Having successfully launched these and other new food products in the domestic market, the German food processing industry must now equip itself to meet the resulting strong demand. Among factors stimulating the industry's investment in modern food processing and packaging equipment are rapidly rising labor costs and sharply increased competition among food manufacturers

Germany: Food processing and packaging equipment market, 1974 and 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on German trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Food processors in Germany are expected in 1978 to purchase nearly $550 million worth of *food processing equipment*, or one-third more than they bought in 1974. There are ample opportunities for increased sales of processing equipment, since mass production techniques have not yet been widely applied in some key sectors of Germany's food industry.

Imports of food processing equipment, valued at $85 million in 1974, are projected to reach $120 million in 1978. This increase represents an average annual growth rate of 9%, a little higher than the 7.5% rate projected for the food processing equipment market as a whole. The U.S. share of imports is expected to advance also as German food processors seek the more highly specialized equipment that American manufacturers offer. U.S. sales could jump from the 1974 total of $7.6 million to $12 million in 1978.

Sales of *food packaging equipment* to German users are forecast to climb by an average 17% per year, to exceed $215 million in 1978 compared with $114 million in 1974. As they adopt modern marketing methods, businessmen in the German food

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: U.S.$1.00 = DM 3.66 (1970); DM 3.32 (1971); DM 3.16 (1972); DM 2.70 (1973); DM 2.55 (1974 and subsequent years).

Germany—Economic Indicators (1973)

Gross national product:	$348.8 billion
Total country import:	$54.8 billion
Imports from U.S.:	$4.6 billion
Total country exports:	$67.5 billion
Exports to U.S.:	$5.7 billion
Population:	62.5 million

industry are paying closer attention to package design and its effect on product identification and acceptance. Moreover, the country's food processors are just beginning to make foods available in family- and economy-size packages.

Imports of packaging equipment by the food industry are forecast to climb by nearly 11% per year, rising from $40 million in 1974 to $60 million in 1978. Increased German demand for heavy-duty, high-speed packaging equipment and machinery with unique features should help American exporters boost their share of the import market from $3.6 million in 1974 to $6 million in 1978.

Competitive Environment

The German food industry currently purchases nearly 80% of its processing equipment and 65% of its packaging equipment from domestic manufacturers. Foreign suppliers of food processing equipment should be able to strengthen their market position somewhat during the next few years. Foreign manufacturers of food packaging equipment may lose ground, however, as German producers begin to pursue this area of the market more vigorously.

A description of U.S. industry's competition from both German and third-country suppliers actively selling in this market is presented in the following paragraphs.

Domestic manufacture.—Germany's food processing and packaging equipment industry comprises approximately 500 companies; roughly 200 of these make processing equipment, 150 manufacture packaging equipment, and the remainder turn out both types of machinery. Medium-size enterprises predominate, although subsidiaries of a few of the country's largest machinery works are also represented. The products of Germany's food processing and packaging equipment industry are known worldwide for their quality; 60% of production is exported.

Leading manufacturers of food processing equipment include Seitz-Werke GmbH and its subsidiary Enzinger Union (beverage industry equipment), Alfa-Laval Bergedorfer Eisenwerke GmbH (subsidiary of the Swedish maker of dairy equipment), Werner & Pfleiderer and the German subsidiary of the British firm, Rose Forgrove Ltd. (bakery equipment), Kramer & Grebe (meat processing machinery), Miag-Muhlenbau und Industrie GmbH (grain milling equipment), Lubeca Maschinen und Anlagen (fish processing equipment), and Hutt GmbH (machinery for the confectionery industry).

Major German manufacturers of food packaging equipment include Werner & Pfleiderer and the Rose Forgrove subsidiary (bakery goods packaging equipment), Kramer & Grebe (vacuum-pack and other meat packaging machinery), and the Alfa-Laval subsidiary (dairy products packaging). Other important companies in this field include Hassia Verpackung A.G., Schmalbach-Lubeca Werke, Hesser Maschinenfabrik, Rose Theegarten, Rommelag GmbH & Co., Rovema-Verpackungmaschinen, and Industeriewerke Karlsruhe. Six manufacturers, FMC Wiesbaden, Dixie-Union Verpackungen, Grace GmbH, Hayssen Europa GmbH, Bostitch GmbH, and Arenco, are subsidiaries of U.S. firms.

Third-country competition.—German end-users look to established manufacturers in other countries for certain types of specialized food processing and packaging equipment or for machinery that has unique features not available in domestically produced equipment. The principal foreign suppliers are the Netherlands, Sweden, and France, followed by the United States, Switzerland, the United Kingdom, and Italy (see table 2).

As a world leader in the production of canned goods and processed meat, the Netherlands has developed a food processing and packaging equipment industry which promotes its products aggres-

Table 1.—Germany: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	40.7	43.1	55
Dairy	44.4	60.0	59
Bakery	37.0	39.2	51
Beverages	59.3	62.7	71
Miscellaneous food products	22.2	27.5	31
Other sectors	171.4	179.5	282
Subtotal	375.0	412.0	549
Food packaging equipment			
Forming, filling, sealing	52.0	63.0	121
Wrapping, packing	28.0	34.0	60
Marking, inspecting	5.0	6.0	15
Container/product/package preparation and handling	10.0	11.0	20
Subtotal	95.0	114.0	216
Total food processing and packaging equipment	470.0	526.0	765

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on German trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Germany: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-1973

(in thousands of U.S. dollars)

	1971	1972	1973
Food processing equipment[1]			
Meat processing equipment			
United States	995	1,127	1,030
The Netherlands	1,524	1,680	2,855
France	898	1,225	1,430
Italy	740	963	1,233
Others	3,679	3,905	4,450
Total	7,836	8,900	10,998
Dairy processing equipment			
United States	359	322	349
The Netherlands	1,844	2,707	4,057
Sweden	1,333	1,654	1,667
France	346	1,117	1,010
Others	1,618	2,864	3,459
Total	5,500	8,664	10,542
Fruit and vegetable processing equipment			
United States	220	113	271
France	87	416	756
The Netherlands	1,430	975	702
Italy	48	65	118
Others	769	488	461
Total	2,554	2,057	2,308
Grain milling equipment			
United States	60	178	55
The Netherlands	380	573	532
Switzerland	501	523	498
Denmark	261	352	487
Others	712	805	920
Total	1,914	2,431	2,492
Bakery products equipment			
United States	212	158	272
The Netherlands	1,700	2,401	2,160
France	726	919	1,443
Sweden	39	413	911
Others	2,073	2,910	3,245
Total	4,750	6,801	8,031
Sugar refining equipment			
United States	79	—	—
Norway	634	582	1,281
The Netherlands	129	89	139
Belgium/Luxembourg	13	66	—
Others	57	84	66
Total	912	821	1,486
Confectionery products equipment			
United States	88	—	73
The Netherlands	1,041	606	521
Italy	455	51	508
Switzerland	115	399	485
Others	632	1,387	1,333
Total	2,331	2,443	2,920
Fats and oils processing equipment			
United States	42	49	—
Austria	—	88	287
The Netherlands	245	122	226
Belgium/Luxembourg	129	16	46
Others	40	347	97
Total	456	622	656
Beverage making equipment			
United States	24	—	14
France	595	1,142	1,795
Italy	420	722	909
Sweden	782	203	253
Others	913	1,717	2,095
Total	2,734	3,784	5,066
Other food processing equipment			
United States	1,507	1,706	1,754
The Netherlands	3,057	3,494	3,910
Sweden	1,492	2,566	3,390
Denmark	1,097	1,601	2,695
Others	5,857	6,260	8,286
Total	13,010	15,627	20,035
Food packaging equipment			
Washing and filling machines for the beverage industry			
United States	590	398	586
Italy	282	320	1,059
The Netherlands	966	1,137	860
United Kingdom	60	100	394
Others	2,490	4,760	5,605
Total	4,388	6,715	8,504
Washing and filling machines for the food processing industry			
United States	264	321	419
The Netherlands	706	387	809
Italy	302	273	486
United Kingdom	184	110	181
Others	1,275	1,002	1,965
Total	2,731	2,093	3,860
Packaging machinery for the beverage industry			
United States	50	50	175
The Netherlands	332	228	325
Italy	114	81	82
United Kingdom	23	18	67
Others	615	437	457
Total	1,134	814	1,106
Packaging machinery for the food processing industry			
United States	270	15	831
Sweden	2,674	4,030	4,571
The Netherlands	904	842	1,846
France	1,862	4,945	1,627
Others	1,052	754	1,548
Total	6,762	10,586	10,423

Source: German Association of Machine-Building Manufacturers.

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[1] Including parts and accessories.

sively and effectively in neighboring Germany. At present, Dutch machinery is highly competitive with that of German producers because of the difference in wage levels between the two nations. Leading Dutch equipment suppliers to Germany include Stork-Amsterdam N.V. (a variety of processing and packaging equipment), Van Dijk Machines N.V. (bakery equipment), Benier N.V. (bakery and confectionery equipment), Breda Packaging N.V., and de Hoop Industrial Packaging Machines.

Swedish and the other Scandinavian firms have garnered an important share of the German import market for dairy and deep-freeze equipment. Their success is based on a long-standing reputation for technological excellence in these fields. Some of the companies selling in the German market are The Square Company AB and Tipe Revent AB, both of Sweden; the Danish firms of Bilwinco A/S (dosimeters), Maskinfabriken HEFA A/S (meat presses), and Scan-Iro A/S (slaughterhouse equipment); and Eian-Lakk, Elopak A/S, and Dyno Industrier A/S of Norway.

Swiss manufacturers are quite competitive in high-performance packaging equipment and in measuring and other instruments used by the German food processing industry. The quality of the machinery made by such firms as Gebruder Buhler AG (bakery and milling equipment) and Schweizerische Industrie-Gesellschaft, known as SIG (packaging equipment), is the major reason for the favorable Swiss position in this market.

Currency devaluations, membership in the European Economic Community (EEC), and even their recent changeover to the metric system are helping British manufacturers sell greater quantities of food processing and packaging equipment to Germany. Baker Perkins Ltd. and Simon-Vicars Ltd. (bakery and confectionery equipment), and RWP Flexible Packaging and Rose Forgrove Ltd. (packaging equipment), are among the United Kingdom's principal exporters to this market.

Sales Opportunities

American manufacturers of food processing and packaging equipment are viewed by German end-users as having a competitive advantage in the sale of technologically sophisticated deep-freeze equipment; heavy-duty, high-speed packaging machinery; highly specialized, single-purpose processing machinery; precision filling, dosing, weighing, and packaging equipment; and instruments for process and quality control. A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find favorable opportunities for sales of the following specific types of equipment to the German food processing industry.

Food Processing Equipment

Beverages.—Color control instruments, viscosimeters, nephelometers, refractometers (online), dosing pumps, concentration control equipment, specific gravity devices, and grape presses.

Dairy.—Ice cream preparation machinery, evaporators for powdered milk, condensed/evaporated milk equipment, rotary disc sprayers, spray-driers for powdered milk production, homogenizers, swept-surface systems for the production of cottage cheese, centrifugal cream extractors, milk irradiators, centrifugal milk clarifiers, and control valves.

Meat, poultry, and eggs.—Bone saws; dehairing, forming, and semiautomatic skinning machines; feet cut-off apparatus; frozen meat saws; sausage-stuffing machines; beaters (tenderizers); frozen meat flakers/slicers/cubers; meat molding machines and presses; boning machines; bone choppers; egg-sorting and -grading machinery; and poultry deep-freezing equipment.

Bakery.—Cookie-filling and doughmixing/kneading/dividing/forming/proofing machines; doughnut automats; enrobing, shaping, and bread-crumbing machines; bread slicers; pastry rolling calenders; cake depositing and icing equipment; and continuous process ovens.

Miscellaneous food products.—All types of continuous mixers, process control instrumentation, mixing and dosing equipment for spices, dosing equipment for instant coffee, coffee-roasting and -freezedrying equipment, and systems for production of potato chips and similar snack foods.

Sugar and confectionery.—Crystallizing apparatus, juice extractors, cocoa bean husking machines, chewing gum equipment, roller mills, dipping machines, tabletting machines, comminuting equipment, sawing and breaking machines, filter presses, enrobing machines, and pulling machines.

Fruit and vegetable.—Rotary and photoelectric sorters, shellers, washers, rotary blanchers, apple-processing systems, juice extractors, abrasive peelers, chemical peelers, pulpers, cooling/freezing equipment, pip-removing machines, strip cutters, slicers, and continuous blender/cooker/cooler/sterilizer systems.

Fats and oils.—Margarine-making churns, oilseed crushers, grinders, and cocoa butter deodorizers.

Grain.—Magnetic separators, hoppers, and sifting machines.

Fish and seafood.—Filleting, scaling, opening, and grinding machines.

Food Packaging Equipment

Forming, filling, sealing.—High-volume bottling and canning equipment, can-sealing machines, fillers for viscous and dry products, gluing equipment, fillers for liquids, vacuum form/fill/seal systems, and tying and stapling equipment.

Wrapping, packing.—Meat portioning and packaging machines, frozen poultry packaging machines, labelers, and flexographic equipment.

Marking, inspecting.—Coding, marking, and inspecting equipment; checkweighers; and seam testers.

Container/product/package preparation and handling.—Box setting-up equipment, palletizers and depalletizers, unloaders, and stackers.

The Food Processing Industry

The German food processing industry includes some 150 large companies (i.e., those with at least 500 employees), nearly 1,000 medium-size firms (100-499 employees), and thousands of small enterprises (see table 3). Together these businesses spent more than $1 billion for capital goods in 1972 (see table 4). Sales by the industry exceeded $32 billion in 1973.

Two major developments are forcing German food processors to reevaluate the capabilities and efficiency of their production equipment. One is the rapid rise in production costs brought on by soaring wages and high oil prices. The other is consumer demand for an ever-increasing variety of food products processed and packaged in ways that make them more convenient to prepare and serve. The effect of these two trends on purchases of food processing and packaging equipment is likely to be a greater demand for single-purpose, specialized machinery and integrated systems.

Despite their acceptance of many new types of prepared foods, German consumers continue to be somewhat prejudiced against frozen foods. This situation, together with the relatively high cost of nitrogen in Germany, has inhibited the food industry's immediate and widespread adoption of quickfreeze technology. Annual sales of quickfreeze equipment are estimated at $8 million to $12 million. Most of this machinery is currently purchased by seafood processors. Market analysts predict that quickfreeze equipment sales will rise by 20 to 30% annually during the balance of the decade.

Table 3.—Germany: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1972*

Sector	Large	Medium	Small
Meat, poultry, and eggs	16	107	37,377
Dairy	14	111	1,144
Fruit and vegetable	8	66	686
Grain	2	23	6,203
Bakery	10	86	47,215
Sugar and Confectionery	36	150	403
Fats and oils	10	20	27
Beverages	38	316	3,408
Fish and seafood	3	25	213
Miscellaneous food products	20	84	794

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[1] Large = 500 or more employees.
Medium = 100-499 employees.
Small = 99 or fewer employees.

Source: Statistisches Bundesamt, Wiesbaden.

Table 4.—Germany: Basic data on food processing industry sectors
(in millions of U.S. dollars)

Sector	Sales by manufacturers (1973)	Capital expenditures (1972)
Meat, poultry, and eggs	8,851.9	148.7
Dairy	4,703.7	161.4
Fruit and vegetable	1,111.1	50.6
Grain	1,629.6	25.3
Bakery	3,777.8	126.6
Sugar and confectionery	2,222.2	94.9
Fats and oils	1,592.6	31.6
Beverages	5,074.1	427.2
Fish and seafood	444.4	22.2
Miscellaneous food products	2,666.7	110.8

Source: Statistisches Bundesamt, Wiesbaden.

Trends in German use of food packaging materials show a definite shift to plastics, especially rigid plastic containers. However, this development has slowed down because of the recent rise in the cost of petroleum and public reaction against the widespread use of nonbiodegradable materials. Observers predict a disproportionate increase in the use of metals for packaging, since the raw materials are plentiful in Europe. A resurgence in consumer acceptance of glass containers is also anticipated.

The five major sectors of Germany's food processing industry (based on the levels of 1972 capital expenditures) are reviewed in the following paragraphs.

Beverage manufacturing.—With combined 1972 capital expenditures of $427 million, manufacturers of beverages form the largest sector in Germany's food processing industry. Their sales totaled $5.1 billion in 1973, up from $3 billion in 1970. The sector's chief products, with 1973 sales figures shown in parentheses, are beer ($2.7 billion), soft drinks ($1 billion), and liquor ($1.2 billion).

Most of Germany's beverage manufacturers are financially controlled by large corporations. Three corporate groups own breweries that together account for 40% of the country's beer production. These are the Bayerische Hypotheken-und Wechselbank (Dortmunder Union, Wickuler-Kupper and 10 other breweries), Reemtsma-Cigarettenfabriken (Bavaria-St. Pauli and four others), and the Oetker Group (Binding-Gruppe and Berliner Kindl A/G). Beer manufacturing firms and their subsidiaries also account for an estimated 40% of Germany's soft drink output

Coca-Cola and Pepsi-Cola are the acknowledged leaders in the soft drink sector of the German beverage industry. Each firm has approximately 30 franchised bottling plants. Sinalco A.G. and Africola-Bluna Centrale GmbH, the main domestic competitors, market their products under similar franchising arrangements. The Eckes Group, a holding company, is Germany's chief distiller of spirits and liquors.

In planning future capital investment, manufacturers of beverages are giving top priority to improving the profitability of their operations. Hence there is widespread interest in the automation of production techniques, particularly in the brewery sector. At least one firm is experimenting with the continuous-flow method of brewing. Others are buying high-capacity cooling equipment and automated filtering machinery. All the larger breweries have already installed high-speed filling and packaging equipment.

Wickuler Kuppers A.G., one of Germany's largest breweries, is carrying out a pilot project at its plant in Wuppertal in which beer is brewed in a continuous operation, in contrast to the conventional batch process. This "Bio-Brewing System" involves wort production, fermentation, maturing, and stabilization in a complete feedback process. The use of pressure and high flow rates cuts fermentation time without requiring any change in the types of yeast or the composition of the wort, factors which are unique to each brewery. The equipment was supplied by Steinecker, Seitz, and Enzinger Union and was installed according to the design developed by the licensor, Beer Brew System GmbH.

Dairy products manufacturing.—Germany's dairy products manufacturing industry in 1972 included 1,269 enterprises, of which only 14 employed 500 or more people and 1,144 had fewer than 100 employees. Capital expenditures by all these firms were valued at $215 million in 1974. The industry's chief products and 1973 output figures are fluid milk, 2.1 billion liters; butter, 3.2 million metric tons (MT); ice cream, 146,000 MT; and cheese and other products, 4 million MT.

The dairy industry is dominated by cooperatives, of which Molkereizentrale Sudwest eGmbH, Sudmilch A.G., and Milchunion Gross-Hanover eGmbH are the most prominent. A number of producers are subsidiaries of multinational corporations; some of these include Allgauer Alpenmilch A.G. (Nestle), Gervais-Danone A.G. (subsidiary of the French firm), Elite-Milchwerke und Edelweissmilchwerke (Unilever), Glucksklee Milchgesellschaft GmbH (Carnation), and Kraft GmbH (Kraftco). Iglo-Langnese, a Unilever-Nestle venture, is the leading German manufacturer of ice cream.

Largely because of government financial incentives designed to stimulate output during recent years, the dairy products industry now has considerable excess capacity for production of fluid milk and butter. However, additional facilities are needed to meet the rising consumer demand for yogurt, cottage cheese, powdered skim milk, ice cream, and dairy dessert products. It appears that only the larger firms have sufficient capital to install the automated equipment necessary to produce this wider range of products to rigid sanitary standards at a profit.

Milk is now packaged mostly in polyethylene bags or wax- or plastic-coated paper containers. Margarine, yogurt, cottage cheese, and many other products are being packaged in rigid plastic containers. Individual portions of butter, cheese, and cream for the restaurant trade are packaged in aluminum foil or thermoform packets. Whipped cream, traditionally a very popular product in Germany, is increasingly being offered in aerosol cans. Family- and institution-size packaging is gaining importance.

A new milk sterilization method, the patented "Uperization" process, is in use at Neuberger Milchwerke A.G., a typical medium-size dairy products plant. Milk that has been preheated to 165° to 175° Centigrade is placed under pressure and passed through a pneumatic control valve into the "Uperizer" chamber, where saturated steam is injected. The steam condenses directly in the milk as the milk temperature is raised above 300°. This elevated temperature is maintained for 2.4 seconds, after which the liquid is transferred to a vacuum vessel, permitting the steam condensate to evaporate. The milk is then abruptly cooled, homogenized by a high-pressure piston pump, and stored in sterile tanks or packed in one-way containers. The evaporating steam is reused in the preheating stage. Most of the equipment used in this system was obtained from Alfa-Laval.

Meat, poultry, and egg processing.—This sector of the food industry represents a particularly good market for fully mechanized processing and packaging equipment. Per capita consumption of meat has increased substantially in Germany in recent years. Moreover, approximately 50% of the meat consumed is in the form of processed products such as sausages and lunch meats, an unusually high pro-
products are being packaged in rigid plastic contain-

German output of meats and meat products (valued at ex factory prices) totaled $8.8 billion in 1973, up more than $1 billion from 1970's level. Firms in the meat processing industry invested approximately $200 million for capital goods in 1974.

Important shifts are beginning to take place in meat preparation, packaging, and distribution patterns. Commercial slaughterhouses located in major livestock-raising areas, the approximately 500 indus-
butcheries owned and operated by retail food chains
butcheries owned and operated by retail food chains,

are gradually assuming the functions once performed mainly by community slaughterhouses and independent butcher shops. Still, the situation by no means resembles that which prevails in the United States. Only 10% of the meat sold in Germany is prepacked.

The Schweisfurth Group, with 1973 sales of approximately $200 million, is the largest German-owned company in the meat processing industry. The group includes Herta K.G., Artland-Dorffler K.G., and Kasserole K.G. The German Consumers' Cooperative Group (GEG), whose 19 meat processing centers employ 2,200 workers, ranks second with 1973 sales of $150 million.

Unilever is the largest multinational corporation participating in the German meat processing industry. Its subsidiary, Schafft, had sales of approximately $40 million in 1973. Unilever also has an interest, along with Nestle, in Iglo-Langnese, which processes meat for its line of frozen convenience foods.

As in other sectors of Germany's food processing industry, the acquisition of equipment that can help cut production costs is being given top priority in meat processors' budget considerations. In addition, the meat industry must take into account the likelihood that government sanitary standards will be raised and that stiff requirements will be enacted concerning waste disposal and other aspects of the pollution problem.

Recent technological trends noted in the meat industry include the widespread use of vacuum cutters by sausage makers, the vacuum packing of large cuts of meat for shipment from slaughterhouse to wholesaler or processor, the replacement of wooden components of meat processing and packaging equipment with components made of plastic and other synthetics, and the installation by some slaughterhouses of completely automated skinning and boning equipment. Some of the newest boning machinery utilized in the industry handles as many as 200 quarter-carcasses per man-hour.

The Karl Reinecke Wurst- und Fleischwarenfabrik, a medium-size enterprise with sales of $6 million and an annual production of 1,250 MT, uses a 500-liter Kramer & Grebe vacuum cutter-mixer in its sausage-making process. This method improves shelf-life and taste by eliminating oxygen from the mixture. All steps in the process—loading, run, feeding, addition of spices, mixing, evacuating, vacuum release, and unloading—are computer controlled.

Bakery products manufacturing.—German output of bread and other baked goods rose from $2.4 billion in 1970 to $3.8 billion in 1973. Per capita consumption has now stabilized after years of steady decline.

The country's more than 47,000 small bakeries account for 70% of sales. Most of these establishments make their own products for direct sale to the public; however, they also handle items manufactured by the 260 regional wholesale bakeries. Companies in this industry were expected to spend $176 million on capital goods in 1974.

The largest companies in the German bakery products industry are to be found among the approximately 50 manufacturers of cookies, crackers, baked snack foods, and similar items. The Bahlsen Group, whose 1973 sales are placed at $240 million, is the industry leader. The Brandt Group ranks second with sales of $60 million, followed by XOX Nabisco (subsidiary of the American firm) with sales of $44 million.

Germany's leading manufacturer of bread is Wwe. Joh. Schutten, which had sales of $40 million in 1973. The bakeries operated by GEG supermarkets registered sales of $37 million in that year, and the firm of Karl Jaus & Sohne had sales of $26 million. A subsidiary of the U.S.-owned Borden Inc., Wilhelm Weber, is the major industrial producer of cakes, pastries, and toasted bread. Weber's 1973 sales totaled $37 million.

Small- and medium-size firms in particular are budgeting substantial sums to fully automate their presently semiautomatic operations. Since they are doing more of their own packaging, they will be buying new packaging equipment, especially models with small-lot capability.

The most modern German bakeries are equipped with continuous-operation, flow-through ovens. Wire-mesh ovens are a standard feature of many new installations. Some firms have switched from the batch process of doughmixing to the continuous process, employing belt-type scales for flour and pneumatic valves or controlled-feed pumps for the liquid ingredients. Automation of all stages of production, from the initial mixing to the final packaging operations, is standard in the major cookie and cracker factories.

At one of the Wilhelm Weber bakeries, automated equipment transports flour from a storage bin, via a screw conveyor, into a 100-liter intermediate silo. The silo acts as a buffer, equalizing the input capacity of the conveyor and the output capacity of the continuous-belt weighing system. An electronic feedback system maintains a constant level within the silo; the Brabender flour dosing scale and the Ring-Armaturen liquid ingredient dosing valves are also electronically controlled. This particular installation turns out 2,600 one-pound loaves of toasted bread per hour.

Miscellaneous food products manufacturing.—Manufacturers of coffee, tea, spices, flavorings, macaroni products, potato chips, and other miscellaneous processed foods recorded sales of $2.7 billion in 1973, compared with $1.6 billion in 1970. Capital expenditures by companies in this sector were valued at $150 million in 1974.

Most of the large enterprises are subsidiaries or affiliates of major multinational concerns. Subsidiaries of Nestle and General Foods, along with a domestically owned firm, Deutsche Extrakt Kaffee, are the country's major producers of instant coffee. Subsidiaries of Nestle, CPC International, and Kraftco make spices and other products.

Three important German-owned companies—Tschibo, Eduscho, and Jacobs—dominate the production of roasted coffee. Schwabe-Nudeln-Werke B. Birkel & Sohne is Germany's most important producer of macaroni and noodles. The August Oetker group markets its line of puddings and baking needs through Oetker AG and Reese AG.

In terms of types of products made and the techniques used to market them, the miscellaneous food products sector is probably the most "Americanized" in the German food industry. Demand for packaging equipment is high, since new products are continually being introduced and the packaging of existing products is often redesigned for marketing reasons. Packaging operations are already highly automated. Vacuum packing is used extensively.

Interest in processing equipment centers on cooling and spray-drying machinery for the instant coffee and instant tea industry, and on continuous kneading and mixing equipment for the macaroni sector. Freeze-dried coffee has been widely accepted, and it is likely that this process will soon be applied in other areas, such as in the production of spices.

Trade and Technical Regulations

Customs duties applicable to food processing and packaging equipment entering the German market range from 4.5 to 6.5%. No tariffs are levied on equipment imported from any of the six original member nations of the European Economic Community (EEC). Tariffs on imports from newly admitted EEC nations and from members of the former European Free Trade Association have been cut by 40% and eventually will be reduced to zero.

Information on specific duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

The characteristics of the German electric power supply are 220/380 volts, 50 hertz, single- and 3-phase current. The metric system of weights and measures is the statutory standard in Germany.

All electrical equipment intended for use in Germany must comply with regulations enacted by the Association of German Electrical Engineers (VDE). In addition, technical standards set by the German Committee for Standards (Deutscher Normenausschuss—DNA) are often made mandatory through issuance as safety regulations. Details can be obtained by writing Beuth-Vertrieb GmbH, 1 Berlin 30 Burggrafenstr. 7; or VDE-Verlag GmbH, 1 Berlin 12, Bismarckstr. 33.

Information on the availability of published standards for food processing and packaging equipment in Germany may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Germany to supplement this report is available on a continuing basis from:

Country Marketing Manager—Germany
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-4414

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

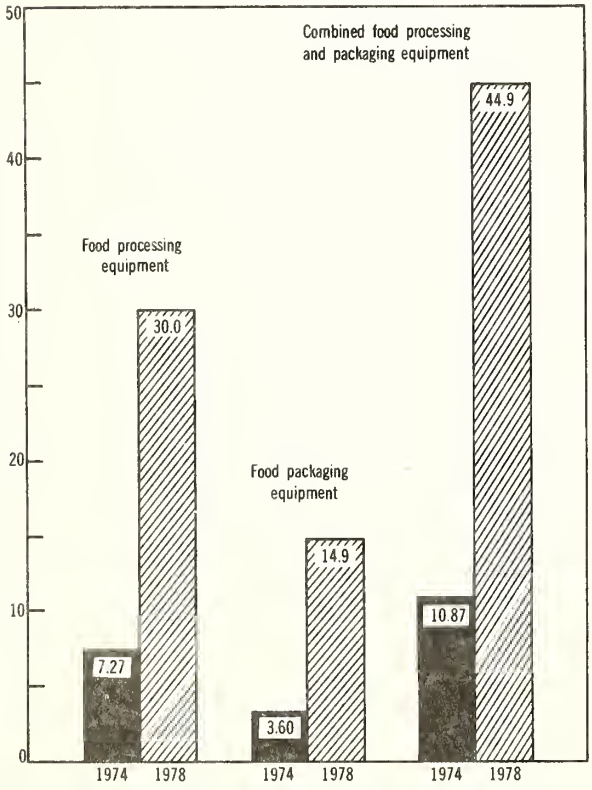
Please request: "The Market for Food Processing and Packaging Equipment in Germany", DIB-74-12-532, August 1974.

Iran

Rapidly increasing oil revenues will continue to bring spectacular growth to the Iranian economy and, with it, to the country's food processing industry. Substantial improvements in personal incomes have already raised the demand for food products beyond present domestic production capacity and have generated a market for more sophisticated processed foods. In response to this situation, Iranian food processors are investing heavily in new plants and equipment. Their plans will be facilitated by the Government's policy and its financial ability to promote agriculturally based industries.

Iran: Food processing and packaging equipment market, 1974 and 1978.

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Iranian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

The market for food processing and packaging equipment in Iran increased by an annual average of 37% from 1972 through 1974 [1], or from $5.8 million to $10.9 million. Average annual growth of 43% is projected for the next 4-year period, with total purchases in 1978 forecast at nearly $45 million (see table 1).

Some trade sources consider this projection a conservative description of the potential market. Predictions of even higher market levels reflect expectations of a greater use of oil revenues for domestic dvelopment. The Government in 1974 revised allocations for the 1973-78 Development Plan, more than doubling the Government's expenditures—from $30 billion to $67.5 billion; the direct impact of this action on the food processing and packaging equipment market, however, has yet to be determined.

Iran's market for *food processing equipment,* which grew from a 1972 level of $3.9 million to $7.3 million in 1974, is projected to reach $30 million in 1978. Processing equipment purchases by sugar and confectionery producers are expected to rise at an extraordinary annual rate of 85% from 1974 through 1978. Large equipment investments are also forecast for the beverage and the fats and oils industries, with manufacturers in both industries expected to increase their purchases by more than 40% per year.

Virtually all food processing equipment used in Iran is imported, and the dramatic increase in mar-

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[1] All statistical figures in this survey are based on the Iranian year, which begins on March 21. All values are shown in U.S. dollars. Local currency data for all years are converted at the following exchange rate: US$1 = 67.5 rials.

Iran—Economic Indicators
(1973)

Gross national product (est.):	**$26.0 billion**
Total country imports:	**$3.4 billion**
Imports from U.S.:	**$476 million**
Total country exports:	**$6.2 billion**
Total country non-oil exports:	**$635 million**
Non-oil exports to U.S.:	**$55 million**
Population:	**31.5 million**

ket size projected for the remainder of the decade will be reflected in substantial increases in imports. Domestic production of food processing equipment is not expected to provide a significant share of the equipment required by the nation's food industry for expansion and modernization during the 1970's. U.S. suppliers provided 17% ($1.24 million) of Iran's food processing equipment imports in 1974; an increase in the U.S. share to about 25% (some $7.5 million) is forecast for 1978.

Food packaging equipment sales are predicted to total $14.9 million in 1978, up from $3.6 million in 1974 and $1.9 million in 1972. The Iranian food industry's packaging techniques lag behind those used in processing. Some closing of this technological gap is anticipated during the remainder of the 1970's, as packaging improvements are planned even by firms that will not be making major processing equipment investments.

Iran's food processors obtain nearly all of their packaging equipment from foreign sources, and they are expected to continue doing so during the next several years. U.S. manufacturers supplied approximately 24%, or $864,000, of Iran's food packaging equipment imports in 1974, and their share is forecast to rise to 30%, or $4.5 million, in 1978.

Competitive Environment

American manufacturers of food processing and packaging equipment face their stiffest competition in the Iranian market from European suppliers. Trade sources foresee no change in this situation for the remainder of the decade.

West European suppliers furnish a major portion of the processing and packaging equipment used by Iran's food industry. German, Italian, British, Swedish, and Danish suppliers are particularly well established in this market. Machines from Eastern Europe, primarily from Poland, Czechoslovakia, and Bulgaria, as well as from the Soviet Union, are also used in many sectors of the food processing industry; much of this equipment was obtained by the Iranian Government through barter arrangements.

Salesmanship and servicing support are important factors in determining a firm's position in the Iranian market. Most European suppliers devote considerable attention to developing contacts and promoting new items. Some of them supplement local promotion activities by sending officials from their headquarters to make periodic calls on prospective clients. European suppliers also assist Iranian purchasers in obtaining favorable credit terms in the manufacturer's country; East European sellers are often able to offer highly attractive credit terms.

Alfa-Laval AB of Sweden, foremost among the European suppliers with favorable market positions, provides a significant portion of the dairy equipment used in Iran, due to both the high quality of its equipment and effective salesmanship. Know-how and promotional effort have made several Italian companies strong in sales of fruit and vegetable processing equipment; chief among these firms are F.B.R., CO.MA.CO., and Rossi Catelli. Cekop of Poland and Skoda of Czechoslovakia provide much of the equipment needed by the sugar processing industry; the quality of their products is high and they hold a price advantage over competitors. The majority of grain mill machinery used in Iran is supplied by the U.S.S.R., mainly because of favorable cost and credit terms.

Other important European suppliers (and the industries for which they supply equipment) are: Seydelmann K.G. and Vemag-Verdener Maschinen (both of Germany), meat processing; A.P.V. (United Kingdom) and Paasch and Silkeborg A/S (Denmark), dairy products manufacturing; Werner & Pfleiderer and Schanker (both of Germany), bakery products manufacturing; Kustner Freres (Switzerland) and Rosedown (United Kingdom),

Table 1.—Iran: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Sugar and confectionery	.30	.36	4.3
Fats and oils	.50	.68	2.8
Beverages	.83	.99	4.1
Other sectors	4.50	5.24	18.8
Subtotal	6.13	7.27	30.0
Food packaging equipment			
Forming, filling, sealing	1.77	2.04	7.4
Wrapping, packing	1.06	1.23	4.5
Marking, inspecting	—	.08	1.5
Container/product/package preparation and handling	.20	.25	1.5
Subtotal	3.03	3.60	14.9
Total food processing and packaging equipment	9.16	10.87	44.9

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Iranian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

fats and oils processing; Majonnier (United Kingdom) and Savalle (France), beverage manufacturing; and Frigoscandia (Sweden) and Bauder (Germany), fish and seafood processing.

There is no significant domestic production of food processing and packaging equipment in Iran. Several firms make general-use items such as tanks, coolers, and conveyers, but none manufactures machinery specifically designed for use by the food industry. The Iranian market is not yet sufficiently large to support a local food processing and packaging equipment industry. Although expansion of product lines by manufacturers of refrigerators, air conditioners, conveyors, and storage tanks is expected to accompany the growth of the food processing industry, it is highly unlikely that domestic manufacturing will extend to the production of sophisticated or highly specialized equipment.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find increasing opportunities for sales of the following types of equipment to the three major sectors of the Iranian food processing industry.

Food Processing Equipment

Sugar and confectionery.—Sugar beet processing systems and sugar cane processing systems.

Beverages.—Brewing and distilling equipment, winemaking equipment, and filtering machinery.

Fats and oils.—Vegetable oil processing equipment, hydrogenation processing equipment, and margarine-making churns.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquids, bottle filling/capping/sealing machinery, and can-making machinery.

Wrapping, packing.—Sugar cube wrapping machinery, sugar packing machinery, candy packaging equipment, chewing gum wrapping/packaging equipment, margarine wrapping/packaging equipment, and bottle packing equipment.

Marking, inspecting.—Imprinting/printing equipment and checkweighers.

Container/product/package preparation and handling.—Container cleaning/washing/drying systems.

The Food Processing Industry

Iran's food processing industry consists of some 6,000 enterprises (see table 2), including both publicly and privately owned firms. The majority are small-scale operations with fewer than 100 employees each. Especially in the bakery, confectionery, and grain milling sectors, "village-level" enterprises characterize activity; most of these small companies employ fewer than 10 persons. Medium-size firms (those with 100-499 employees) are especially prevalent in the sugar, fats and oils, and fruit and vegetable processing sectors. Large organizations (500 or more employees) are confined to the beverage, dairy, sugar and confectionery, and seafood processing sectors.

Table 2.—Iran: Number of enterprises in food processing industry sectors by size [1] *of enterprise, 1973*

Sector	Large	Medium	Small
Meat, poultry, and eggs	—	2	2
Dairy	1	1	9
Fruit and vegetable	—	10	18
Grain	—	—	1,156
Bakery	—	3	3,240
Sugar and confectionery	1	29	1,035
Fats and oils	—	14	150
Beverages	2	7	37
Fish and seafood	1	1	1
Miscellaneous food products	—	—	112

[1] Large = 500 or more employees.
Medium = 100-499 employees.
Small = 99 or fewer employees.

Source: Data based on *Iran Almanac, 1974,* and Iranian trade source estimates.

Enterprises in the meat, dairy, and fish and seafood sectors generally have fairly modern processing equipment, but periodic raw material shortages limit their full-capacity operation. In other areas of Iran's food processing industry, antiquated machinery and techniques are typical, and major equipment investments for both processing and packaging operations will be essential if significant rises in output are to be achieved.

The Iranian Government plans the expansion of existing publicly owned facilities as well as construction of new processing plants in the meat, dairy, sugar, fruit and vegetable, and fish and seafood industries. East European countries and the U.S.S.R. are expected to supply much of the processing and packaging equipment for these enterprises.

Privately owned plants in the meat, fruit and vegetable, grain mill, sugar, fats and oils, and beverage industries will undergo modernization and major expansion in both processing and packaging operations. Packaging improvements will constitute the major investments by private firms in the bakery, confectionery, dairy, and fish and seafood industries.

Recent technological improvements in Iran's food processing industry have focused mainly on quickfreeze methods. The dairy products manufacturing and fish and seafood processing sectors are the only current users of quickfreezing equipment; increased use in these areas and expanded application to other sectors are forecast for the remainder of the 1970's. Various types of quickfreezing equipment, particularly tunnel, contact, and airflow, will be sought during the 1975-80 period by processors of meat and poultry, bakery goods, and fruits and vegetables. Most frozen food products are handled by supermarkets; consumption is increasing rapidly but is confined mainly to residents of the major cities, particularly Tehran. During 1973, an estimated 100 tons of frozen foods were consumed in Tehran. This figure doubled during 1974 to about 200 tons, and trade sources forecast a level of about 400 tons by 1978. Similar increases are expected in other metropolitan areas.

Packaging innovations in the various sectors of the food industry during recent years have consisted mainly of greater use of plastic materials and disposable containers. Plastic wrap is used for packaging meats. Glass, paper, and coated cardboard are the predominant packaging materials for dairy products, but an increased use of plastics is anticipated, especially the flexible "pillow-packs" for school milk programs. Disposable cardboard cartons are gaining broader acceptance for milk products, and over the next decade they are expected to replace glass bottles for most retail milk sales. Paper is used for packaging ice cream and butter.

Fruits and vegetables are preserved in tinplate and glass. Wheat flour is sold in paper bags at the retail level and in cloth sacks to quantity consumers; potato, rice, and chickpea flours are packed in polyvinyl chloride (PVC) containers. Sugar and bakery products reach the buyer in plastic and cardboard containers; candies and sweets in plastic, cellophane, or paper; and chewing gum in paper wrappers. Tinplate, glass, and plastics, now used for cooking oils, will be supplemented by paper and cardboard packaging with the introduction of margarine production. Glass is the chief material used for beverage containers, since cans have yet to make inroads in this sector. Fish and seafood products are packed in plastic, cardboard, and tinplate. Such foods as potato chips, noodles, and macaroni are normally sold in plastic and cardboard packages.

The Iranian Government is encouraging expansion of the food processing industry through direct investments in public enterprises and through financial assistance (in the form of credit and loans) to private investors. Iran's Fifth Development Plan for 1973-78 places high priorities on the promotion of agriculture and agriculturally based industries; the Government is committed to the objective of assisting such enterprise in order to raise per capita income in agriculture, alleviate food shortages, and expand both rural and urban employment opportunities. Increased meat and poultry production and a substantial expansion of dairy production are national goals, and the promotion of fruit and vegetable processing is also given special emphasis. Funding for the Fifth Plan was revised upward during 1974; current allocations call for expenditures of $3.6 billion in the agricultural sector and $5.2 billion in the manufacturing sector. A significant portion of the latter is expected to be used to promote food processing.

The major sectors of the Iranian food processing industry are sugar refining and confectionery manufacturing, beverage manufacturing, and fats and oils processing. Their importance is based on the number and scale of enterprises engaged in these activities and on the expectation that they will account for a significant portion of the food processing and packaging equipment market during the next four years. However, important equipment purchases will also be made by firms in other sectors during the 1974-78 period: meat processing (one firm plans a $2 million investment to increase pork products output from 17 tons to 34 tons daily); grain milling (a 50% increase in the sector's total flour milling capacity); fruit and vegetable processing (capacity increases for juice, baby food, vegetable, and vinegar processing); and fish and seafood processing. A review of the three major sectors follows.

Sugar refining and confectionery manufacturing.—Iran's output of sugar reached 664,000 tons in 1972, an increase of 4,000 tons over the preceding year. Production of sweets was 30,000 tons in 1972, compared to 28,000 in 1971; output of chocolates was 21,000 tons, or 3,000 tons more than 1971's output. Total fixed assets of the industry's manufacturers were estimated at $29 million in 1973.

Some 1,065 businesses—most of them very small—constitute the industry. Of a total of 32 sugar refineries, 5 employ about 100 workers each. One chewing gum and sweets producer has between 250 and 300 employees, while at least 1,000 candy producers average about 5 workers.

Daily output of sugar refineries ranges from 500 tons to 4,000 tons. The principal manufacturers are Isfahan Sugar Company and Shearvan Sugar Company; each accounts for 8% to 10% of total sales. There are two major firms engaged in confectionery production: the Vitana Company, which provides about 25% of the market, and the Pars Manufacturing Group, a holding company that controls enterprises accounting for another 25% of confectionery sales.

Trade sources forecast an increase of 20% in the industry's production capacity during the 1974-78 period. Sugar beet processors plan to construct new facilities and to expand existing plants, and there are plans for at least one totally new cane sugar processing unit in the 1976-78 period.

As in most sectors of the Iranian food processing industry, management in the sugar refining and confectionery manufacturing industry is receptive to new production methods and the use of more automated systems.

Much of the sugar processing and packaging equipment used in Iran is of European origin; in a typical refinery most equipment is at least 10 years old and was purchased from a variety of suppliers. At the Shearvan Sugar Company refinery, for example, the centrifuges were obtained from German suppliers (B.R.W., Salzgitter, and Braunschweiger Maschinenbauanstalten), and the juice extractors, defecation vessels, evaporators, and crystallizing apparatus were supplied by Skoda of Czechoslovakia and Cekop of Poland. In packaging operations, the same East European suppliers provided fillers for dry products. Most of Shearvan's processing and packaging equipment was installed in 1961, and no major components have been installed since 1968.

Beverage manufacturing.—Iran produced 236 million bottles of soft drinks, 50 million of beer, and 20 million of liquor and wine in 1972. Soft drink production in that year was 5% greater than that in the preceding year; beer output increased 25% over the 1971 level, and liquor and wine increased 33%.

Fixed assets in the beverage industry in 1973 were valued at $52 million. There are 46 enterprises engaged in beverage manufacturing; 2 large plants each employ more than 500 persons, while 7 employ 100-499 persons.

Several major beverage manufacturers plan large increases in production capacity by 1978. Iran Malta will invest $2 million in the 1976-78 period to double its beer output to a capacity of 20 million liters a year. Investments in the million-dollar range are planned for 1975 by Iran Distillery Company (liquor), Zamzam Company (soft drinks), and Meykadeh Company (liquor).

Illustrative of beverage industry technology are the operations of the Sasan Company, Iran's largest soft drink manufacturer. Sasan has seven plants, four of which are wholly owned by the company and three of which are franchised to other parties. Products include such name-brand beverages as Coca-Cola, Canada Dry, 7-Up, and Fanta. Sasan's equipment is of American and European origin, and most was installed in the 1967-69 period. American-made equipment includes storage/cookers (Cherry Burrell), bottle-washers (George J. Meyer Manufacturing), compressors (Frick Company), and water softeners (Permutit). Filters are German-made (Zeiss), and the carbination cooler and automatic case packer are from the United Kingdom (Majonnier).

Fats and oils processing.—Iran produced 62,000 tons of fats and oils in 1972, an increase of 2,000 tons over 1971. The industry consists of 164 enterprises. Most output is provided by 14 medium-scale plants (those with 100-499 workers), but there are also some 150 small oil-pressing facilities, with about 5 workers each, located in villages throughout Iran. The fats and oils processing industry's fixed assets totaled an estimated $21 million in 1973.

Two manufacturers account for a major portion of the industry's total sales: Behshar Industrial Company provides an estimated 40%, while Pars Manufacturing Company accounts for about 30%.

Considerable modernization and expansion are plannead by producers of fats and oils for the remainder of the 1970's. Most manufacturers plan to increase production capacity, and at least one firm plans a thorough modernization of its processing system. The introduction of margarine production in Iran within the next few years is tentatively scheduled by some companies.

The operations of the Shahyan Vegetable Oil Manufacturing Company illustrates the prevailing technology and capacities of firms in the fats and oils industry. Shahyan is among Iran's five largest producers deriving oils from cottonseed, sunflower seed, corn, and soybeans. Current capacity is 20 tons per day, but the company plans to invest $2 million in 1975-77 to increase daily output to 60 tons. The major processing components at Shahyan were installed approximately 20 years ago. In the pressing process, cleaners are of local manufacture; the delinters are from Carver Company (United States) and Rosedown (United Kingdom); the shaker and filter are also from Rosedown; and the press is from

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Iran to supplement this report is available on a continuing basis from:

Country Marketing Manager—Iran
Commerce Action Group for the Near East
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-3752

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in Iran," DIB 74-11-511, August 1974.

The Office of Export Development also has available for $3.00, a "Target Market Trade List: Food Processing and Packaging Equipment—Iran," which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

Skoda (Czechoslovakia). The deodorizer for the hydrogenation process was made locally. The packing and filling equipment were provided by Kustner Freres SA of Switzerland.

Trade and Technical Regulations

Customs duties on imports of food processing and packaging equipment into Iran generally range from 5% to 20%, and an additional Commercial Benefits Tax ranges from 5% to 17% of the item's value.

Further information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Commerce Action Group for the Near East, BIC/DIBA, Room 5015, Main Commerce Building, Washington, D.C. 20230.

Electrical power supply characteristics throughout Iran are 220/380 volts, 50 cycles; voltage occasionally fluctuates between 190 and 240 volts. The metric system of weights and measures is the statutory standard in Iran.

Many food products are subject to quality, packaging, and labeling requirements established by the Institute of Standards and Industrial Research of Iran, Post Box No. 2937, Tehran. This Institute publishes specifications manuals and an annual listing of standardized products; the manuals are originally issued in Farsi (Persian), but many have been translated into English.

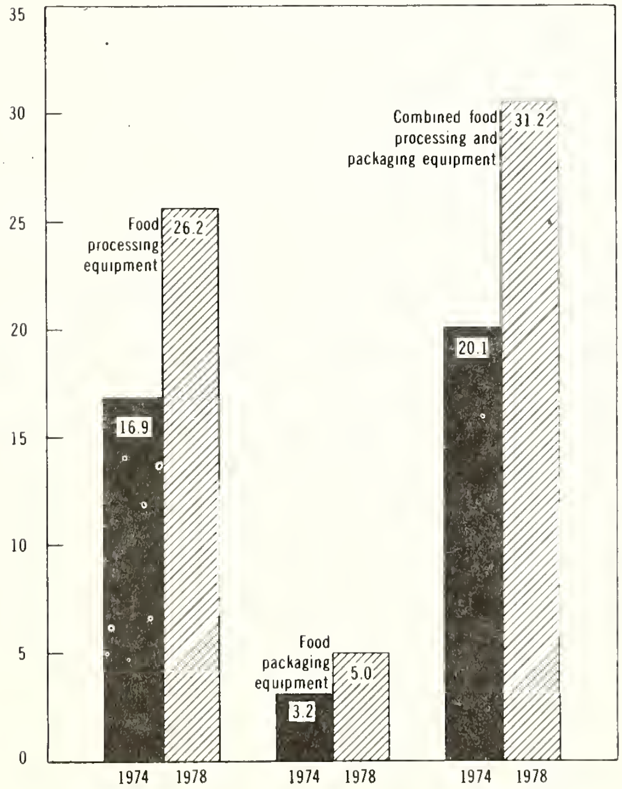
Information on the availability of published standards for food processing and packaging equipment in Iran may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Israel

Israel's flourishing food processing industry provides a firm basis for strong growth in demand for food processing and packaging equipment. Sales of this equipment are projected to rise from $20 million[1] in 1974 to more than $30 million in 1978 (see table 1), reflecting an average annual growth rate of 11.6%.

After reaching a total of $22 million in 1972, the market declined slightly in 1973-74 because of the general economic disruptions associated with the October 1973 War. Manpower shortages and difficulties with raw material supplies hampered food processing as well as most other industries, and many investments in new plants and equipment were postponed. Recovery of the sales volume for food processing and packaging equipment is anticipated during 1975.

Israel: Food processing and packaging equipment market, 1974 and 1978.
(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Israeli trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Food processing equipment sales are projected to surpass $26 million in 1978. Sales of this equipment during 1973 and 1974 were stable but at a level approximately $2 million below 1972's $19 million, as major equipment purchases were deferred during the war and its aftermath. Most sectors of the food processing industry were prepared to resume investment programs in late 1974 and 1975, and recovery and expansion of equipment purchases are forecast for the remainder of the 1970's. This market is expected to increase at an average annual rate of 11.5% from 1974 through 1978.

Imports of food processing equipment are forecast to rise at an annual rate of 6.3% from $9.4 million in 1974 to $12 million in 1978. Predicted increases in domestic production of this equipment are likely to somewhat reduce Israeli food processors' reliance on foreign sources of supply.

The U.S. share of food processing equipment imports in 1974 was 19%, or $1.8 million, and is projected to reach 20%, or $2.4 million, in 1978. According to Israeli trade sources, sales opportunities for U.S. suppliers are broadening because of better price comparability between U.S. and European suppliers and the demonstrated quality of the U.S. equipment installed in Israeli food processing plants during the early 1970's.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1 = 3.95 Israeli pounds (1971); 4.20 Israeli pounds (1972 and subsequent years).

Israel—Economic Indicators (1973)

Gross national product:	**$8.7 billion**
Total country imports:	**$2.9 billion**
Imports from U.S.:	**$549 million**
Total country exports:	**$1.4 billion**
Exports to U.S.:	**$267 million**
Population:	**3.3 million**

Sales of *food packaging equipment*, which just exceeded $3 million in 1972 and again in 1974, are forecast to reach $5 million in 1978. This projection represents a nearly 12% average annual rate of growth for the next 4 years, during which period packaging techniques are expected to be modernized to keep pace with processing improvements.

Imports of food packaging equipment, valued at $2.6 million in 1974, are anticipated to rise by about 9% per year to $3.7 million in 1978. Local producers of packaging equipment may offer increasing competition to overseas suppliers in this market, but to a lesser degree than in the market for food processing equipment.

U.S. suppliers provided 13%, or $343,200, of Israel's imports of food packaging equipment in 1974. Forecasts indicate that this share will be maintained through 1978, with imports from the United States approaching the half-million dollar level in that year.

Competitive Environment

Foreign suppliers hold the major share of the Israeli market for food processing and packaging equipment and are predicted to maintain a strong position throughout the remainder of the 1970's. Increased domestic production is anticipated for both types of equipment, but the size of the Israeli market does not presently justify local manufacture of the technologically advanced equipment most in demand by the Israel food processing industry.

Aggressive marketing and a good local reputation for after-sales service and parts-supply are the primary factors determining sales success in the Israeli market. Many European suppliers, by devoting considerable attention to these factors, enjoy established reputations in Israel. Until recent years European manufacturers of food processing and packaging equipment also had a price edge over U.S. competitors. However, the combined effects of currency revaluation and rapidly rising prices for European equipment during the early 1970's have virtually eliminated that advantage.

A description of the domestic and third-country competition faced by U.S. suppliers in Israel's food processing equipment and food packaging equipment markets follows:

Food processing equipment.—European suppliers furnish a considerable portion of Israel's requirements for food processing equipment (see table 2). German manufacturers are particularly well established in the market; foremost among them are Wilhelm Fessman (baking and smoking ovens), Vemag-Verdener Maschinen (stuffing machines), F. Seneca (grinding machines), Westfalia Separator A.G. (extractors, pasteurizers, centrifugal clarifiers, buttermaking machines, and condensed/evaporated milk equipment), Schroder & Company Maschinenfabrik (oil seed crushers, grinders, and homogenizers), Astra (pasteurizers and homogenizers), Fr. Winkler K.G. (breadmaking machines), and Buck-Valf (centrifuges for sugar beet processing).

Other European firms supplying the market include the Swiss manufacturers Hollymatic A.G. (hamburger-making machines) and Buhler Corp. (grain mill equipment); two Dutch companies, Jongia Machine Fabriek and Bronswerk N.V. International (both selling dairy processing equipment); and the Italian firms Rossi Catelli (tomato-grinding and -chopping machines) and Padovan (refrigerated bulk cooling tanks). British suppliers include A.P.V. International Ltd. (extractors, plate heat exchangers, pasteurizers, homogenizers, and ice cream freezing equipment), Henry Simon Ltd. (grain milling equipment), Tweedy (rounding-proofing machines), Baker Perkins Ltd. (biscuit-filling machines), and A. Johnson and Company Ltd. (margarine-making churns). Also holding a strong position in the Israeli market are Alfa-Laval AB of Sweden (juice extractors,

Table 1.—Israel: The market for food processing and packaging equipment, 1973, 1974, and 1978

(in millions of U.S. dollars)

	1973	1974	1978
Food Procesing Equipment (by sector)			
Meat, poultry, and eggs	1.35	1.35	2.1
Dairy	1.52	1.52	2.3
Fruit and vegetable	4.06	4.06	6.3
Other sectors	9.98	9.98	15.5
Subtotal	16.91	16.91	26.2
Food Packaging Equipment			
Forming, filling, sealing	1.38	0.93	1.5
Wrapping, packing	0.38	0.25	0.4
Marking, inspecting	0.43	0.29	0.4
Container/product/package preparation and handling	2.57	1.72	2.7
Subtotal	4.76	3.19	5.0
Total food processing and packaging equipment	21.67	20.10	31.2

Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Israeli trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Israel: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-73

(in thousands of U.S. dollars)

	1971	1972	1973
Food Processing Equipment			
Dairy machinery			
United States	8	—	6
The Netherlands	35	115	167
Germany	70	41	—
United Kingdom	17	21	—
Other	38	10	5
Total	168	187	178
Wine, fruit juice-making machinery, etc.			
United States	160	145	62
Germany	2	42	59
France	16	26	16
Italy	3	14	—
Others	3	3	8
Total	184	230	145
Machinery for milling grain			
United States	130	6	47
Germany	14	26	707
Switzerland	56	99	345
The Netherlands	19	11	198
Others	32	35	154
Total	251	177	1,451
Other processing machines for the food and drink industry			
United States	384	487	554
Germany	362	1,111	942
Italy	229	158	775
United Kingdom	209	245	578
Others	206	638	535
Total	1,390	2,639	3,384
Refrigerating equipment [1]			
United States	548	1,227	1,190
Italy	466	722	1,265
The Netherlands	85	51	366
Germany	45	210	317
Others	139	369	594
Total	1,283	2,579	3,732
Mechanical appliances for the soap and food industry [1]			
United States	44	414	131
Italy	37	305	1,030
Germany	133	313	387
Switzerland	6	208	21
Others	118	116	145
Total	338	1,356	1,714
Packaging Equipment [2]			
Machines for cleaning or filling containers; machines for canning, wrapping, packaging, etc.			
United States	588	562	705
Germany	826	1,269	1,567
Belgium	332	383	979
United Kingdom	429	264	817
Others	1,610	1,165	1,650
Total	3,785	3,643	5,718

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[1] Since Israeli official trade statistics do not differentiate between processing equipment for food and non-food uses in this equipment category, both types of equipment are included in these figures.

[2] Since Israeli official statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Israeli trade sources to account for 75% of total packaging equipment imports in 1971, 74% in 1972, and 75% in 1973.

Source: *Israeli Foreign Trade Statistics Quarterly*, 1971 through 1973.

centrifugal clarifiers for milk and brewery products), and Pera of France (clarifiers for beverages).

The Israeli food processing equipment industry consists of some 20 manufacturers. A broad range of machinery is produced, but almost no local equipment manufacturers specialize in supplying complete food processing systems. Only for the bakery sector is the domestic industry able to provide all the equipment used on a production line.

The scope and scale of domestic production have been limited by the size of Israel's market and the absence of skilled engineering specialists with basic knowledge of food processing. Domestic production is expected to gain a greater share of the market during the remainder of the 1970's; the Industry Development Plan for 1970-80 forecasts that by 1980, Israel's food processing equipment manufacturers should be capable of producing flour and grain mill equipment, as well as various types of machinery used for processing butter, candy, gum, soft drinks, distilled liquor, wine, malt, malt liquors, and seafood products.

Government policy has been directed at protecting domestic producers through high tariff rates on imported equipment which is similar to that produced locally. Since 1973 the Government has sought means to reduce the impact of defense spending on its industries and to encourage local producers to apply experience acquired with sophisticated military machinery to the development of

Table 3.—Israel: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1973*

Sector	Large	Medium	Small
Meat, poultry, and eggs	1	4	73
Dairy	8	2	14
Fruit and vegetable	15	4	21
Grain	—	3	23
Bakery	4	10	156
Sugar and confectionery	5	7	108
Fats and oils	5	1	—
Beverages	38	6	85
Fish and seafood	5	3	20
Miscellaneous food products	2	4	87

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[1] Large = 101 or more employees.
Medium = 51-100 employees.
Small = 50 or fewer employees.

Source: Israeli National Insurance Institute.

equipment for Israel's export industries, including the processed foods industry. The Ministry of Commerce and Industry has encouraged food processing equipment manufacturers to seek licensing agreements abroad to improve their technology and increase their share of sales in the domestic market.

The major Israeli manufacturers are Simhon Metal Works Ltd., Sharnoa Ltd., and Eshet-Eilon Agricultural Machinery Works. Simhon produces an extensive line of conveyor, crane, and vibrating equipment, positioning tables, and specialized materials-handling equipment (particularly for fruits and vegetables). Simhon has licensing agreements for use of Swedish technology (Hydrolex) for production of positioning tables and platforms, and Italian technology (Venancheti) for vibrating equipment. Sharnoa produces conveyor systems, cranes, weighing apparatus, materials-handling equipment, and poultry slaughtering equipment. The product lines of Eshet-Eilon are similar to those of Simhon and Sharnoa; this firm has licensing agreements with several U.S. firms (John Deere, New Holland, and Lockwood) and with Grifa of Holland for production of collators and presses, and with Kramer & Grebe of Germany for other processing equipment.

Additional important domestic manufacturers include Polka Ltd. (automatic bakery lines for bread), which has a licensing agreement with Fr. Winkler of Germany for production of baking ovens; Haroshet Pladot Ltd. (stainless steel food processing equipment), which has a licensing agreement with A.P.V. of England for the manufacture of extractors and similar products; and Gershon Paglin & Sons (automatic bakery lines for bread). Other producers of bakery equipment are Mechanica Jacobi (bakery sheeters), Alka Metal Works Ltd. (baking machines for rolls), and Bar-Eytan Ltd. and Termoil Ltd. (both manufacturers of baking ovens). Important specialized equipment makers are Magat Ltd. (milk processing and fruit concentrates machinery), Egmo Ltd. (stainless steel food processing articles), Centra Pumps Ltd. (centrifugal pumps), Kiryat Anavim Metal Works (fruit and vegetable grading and sorting apparatus), and A. Kisluk & Sons Ltd. (materials handling equipment).

Food packaging equipment.—German, Belgian, and British manufacturers are principal suppliers of packaging equipment to Israel's food industry. The most important of these include Komet Maschinenfabrik (vacuum packaging machines), Enzinger (packaging machines), Rovema (forming, filling, and sealing equipment) and Hesser (packaging machines), all of Germany; Albro. (filling and corking machinery), Adams Dowel (labelers), and Dawson & Barfos Ltd. (bottle-washing machines), of the United Kingdom; and Pfaudler (filling machines for liquids and viscous products) of Belgium.

Israel's food packaging equipment industry consists of 21 enterprises, many of which also produce food processing equipment. Simhon, Sharnoa, and Eshet-Eilon, for example, make special equipment for citrus packaging operations. Sharnoa has a licensing agreement with Australian Paper Manufacturers (A.P.M.) for the production of cartoners. Other firms making food packaging equipment are Mezek Ltd. and M.G.T. Israel Ltd. (both makers of materials handling equipment for packaging operations), and Kiryat Anavim Metal Works (packing equipment for fruits and vegetables).

Government efforts to promote packaging equipment production in Israel are similar to those applied to food processing equipment and are oriented toward assisting production that will result in increased exports. According to the Industry Development Plan for 1970-80, Israeli industry will be prepared by the 1980's to produce meatpacking equipment, fruit and vegetable canning equipment, paper bag production machinery, and boxmaking apparatus.

Sales Opportunities

A market research survey conducted in 1974 by the Bureau of International Commerce, Office of International Marketing, indicates American manufacturers will find opportunities for sales of the following types of equipment to the principal sectors of the Israeli food processing industry.

Food Processing Equipment

Meat, poultry, and eggs.—Beaters (tenderizers), sawing machines, molding machines/presses, poultry defeathering and eviscerating equipment, frozen meat flakers/slicers/cubers, bone choppers, boning machines, gutting machines, power cleavers, and sausage stuffing machines.

Fruit and vegetable.—Rotary blanchers, apple processing systems, juice extractors, abrasive peelers, pulpers, S-presses, vacuum gravity separators, bean graders, bean snippers, vegetable graders (onions, potatoes, etc.), continuous blancher/cooker/cooler/sterilizer systems, cooling/freezing equipment, fruit drying equipment, pickling equipment, pip-removing machines, shredding/grinding/chopping machines, washing machines, and strip cutters, and slicers.

Dairy.—Homogenizers, pasteurizers, ice cream preparation, freezing, cutting, and coating equipment.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquids, dry products, viscous products, and solids; gluing machinery; cutting, slitting, trimming equipment; vacuum form/fill/seal systems; can closers, sealers; and tying, sewing, stapling equipment.

Wrapping, packing.—Direct wrappers, cartoners, multipackers, and shrink wrappers and tunnels.

Marking, inspecting.—Labelers, checkweighers, and metal detection equipment.

Container/product/package preparation and handling.—Box setting-up equipment, unscramblers, palletizers, and unloaders.

The research study also indicate a strong demand in Israel for quickfreezing and refrigeration equipment (condensors/evaporators and refrigerated bulk cooking tanks) and such other types of equipment as swept-surface heat exchange process systems, aseptic systems for processing and bulk storage of products from single strength to concentrates, and continuous mixers (solids/solids, solids/liquids and liquids/liquids).

The Food Processing Industry

A total of 714 enterprises are engaged in food processing activities in Israel, 83 of which are large-scale firms employing more than 100 persons (see table 3). Most of the larger firms process fruits, vegetables, and beverages (primarily soft drinks). Total processed food sales by Israeli manufacturers surpassed $624 million in 1971, and capital expenditures by the industry in that year approached $30 million (see table 4).

Considerable modernization of processing and packaging techniques began in the early 1970's. Quickfreezing, introduced in 1970, has since gained wide acceptance. The range of dehydrated products made in Israel has increased substantially, and there are several research projects directed at developing new products and improving dehydration processes. Other techniques being considered by the industry include aseptic systems, primarily for use in fruit and vegetable processing.

Packaging innovations adopted during recent years have included utilization of cans for beer, plastic bags for pasteurized milk, and Pure-Pak contons, including over 200 million units of bottles and tainers for other dairy products and noncarbonated soft drinks. Glass container consumption by food processors in 1973 reached approximately 54,000 jars. During 1974 the industry used some 360 million tin can containers and 1.6 billion tin caps and seals.

Table 4.—Israel: Basic data on food processing industry sectors, 1971

(in millions of U.S. dollars)

Sector	Production	Annual capital expenditures
Meat, poultry, and eggs	59.1	3.6
Dairy	92.7	2.9
Fruit, vegetable, and fish	86.7	7.4
Grain	132.5	2.8
Bakery	57.7	5.4
Confectionery	30.7	1.1
Fats and oils	73.6	1.7
Beverages	50.2	2.9
Sugar and miscellaneous food products	41.3	1.6

Source: *Industry and Crafts Survey, 1971*, Jerusalem, 1973.

Tin cans are used for meat and poultry preserves, and plastic bags for sausages, fresh poultry, and precooled frozen foods. Cartons are utilized for bulk packaging, mainly for export. Some 95% of bakery products are wrapped in folding cartons covered with stain-resistant materials; plastic bags are used for bread. Most beverages and fats and oils are stored in glass bottles. Grain mill products are packed in paper bags, polyethylene and cellophane bags, and utta sacks. Plastic bags and waxed cardboard boxes are employed for frozen fruits and vegetables; for fruit and vegetable preserves, tin cans and glass containers are used.

Israeli consumers' growing demand for convenience foods is largely responsible for the increasing investment in modern food processing equipment, but export promotion is also a factor. Processed foods account for 7 to 8% of Israel's exports, or $105.5 million in 1973, and the Government actively fosters research and development of food products with an export potential. Another factor contributing to the industry's interest in new equipment is the need for more automated processing systems because of manpower shortages, a situation made more difficult by repeated defense mobilizations. In most instances, food processing companies are interested in automated equipment that does not require a high degree of skill for operation.

Most major food manufacturers have extensive plans for expanding production and modernizing processing and packaging techniques, several of which are specifically directed at increasing the export component of production. Many investments scheduled for implementation during 1973 and early 1974, particularly plant relocations, were deferred

Table 5.—Israel: Production by food processing industry sectors, 1970-72

	Unit	1970	1971	1972
Meat and poultry [1]	thousand tons	n.a.	12.5	14.6
Dairy				
Pasteurized milk	million liters	132.2	142.0	157.3
Sterilized milk	million liters	11.3	12.5	14.0
Other dairy products	thousand tons	75.8	82.4	92.2
Fruit and vegetable	thousand tons	98.8	122.5	139.7
Grain	thousand tons	334.0	369.5	372.9
Bakery				
Bread and rolls	thousand tons	209.0	226.6	n.a.
Biscuits and wafers	thousand tons	15.2	16.6	17.9
Sugar and confectionery	thousand tons	75.6	82.3	80.0
Fats and oils	thousand tons	132.4	142.2	151.2
Beverages	million liters	221.6	348.4	340.6
Fish and seafood	thousand tons	2.8	2.9	n.a.
Other food				
Matzot and matzot flour	thousand tons	8.4	9.4	9.6
Noodles	thousand tons	8.5	8.9	9.2
Coffee (instant and ground)	thousand tons	5.5	6.2	n.a.

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[1] Excludes eggs.

Source: *Statistical Abstract of Israel, 1973* and Israeli Department of Commerce and Industry.

until late 1974 and 1975. The implementation of these investment programs will present excellent opportunities for increased sales of food processing and packaging equipment.

The three sectors of Israel's food processing industry expected to offer U.S. equipment manufacturers the most promising sales potential in the years ahead are reviewed below.

Fruit and vegetable processing.—The fruit and vegetable processing industry invests more in equipment than any other food sector. It also leads other food industry sectors in expenditures for research and development of new products and processes.

Total sales by fruit and vegetable processors in 1971 were valued at approximately $80 million, and capital investments amounted to more than $7 million. Enterprises with more than 100 employees account for 50 to 90% of output of the various products; a single firm produces 90% of the total amount of frozen vegetables, while 10 factories are engaged in making dried soups, spreads and sauces (5 of these provide 90% of output).

Israeli processors produced 139.700 tons of processed fruits and vegetables in 1972 (see table 5), which represented an average annual increase in output of almost 19% from the 1970 level. Production in 1972 comprised 54,100 tons of preserved fruits, 49 million liters of citrus concentrates, and 38,300 tons of preserved tomatoes. Also important was the output of preserved peas (6,900 tons), pickled vegetables (8,800 tons), olives (6,600 tons), dried soups, and spreads (mainly tchina, humus, and mayonnaise).

The fruit and vegetable processing industry is a major contributor to processed food exports, and the Government has provided firms in this sector with technical and financial assistance. Government-sponsored research on techniques for preparing frozen and dehydrated vegetables has assisted this industry. Surveys sponsored by the ministries of Agriculture and Commerce and Industry have focused on specific problems of tomato processing and quality improvements for canned citrus products.

Group holding companies engaged in fruit and vegetable processing are Assis Ltd.; Elite Israel Chocolate & Sweets Manufacturing Company Ltd.; Koor Industries Ltd.; Milouot Haifa Bay Settlement Development Company Ltd. (which has three subsidiaries engaged in fruit and vegetable processing); Muenster, Israel Foodex Ltd.; Yakhin Canning Company Ltd.; and Tnuva Ltd.

The principal processors of citrus juice and tomato products are Milos Ltd., a subsidiary of Milouot, which accounts for 68% of the citrus and 27% of tomato products output; Yakhin; Assis; and Rimon. Sunfrost Ltd. dominates frozen vegetable production (cut beans, peas, whole leaf spinach, and okra). Deco Swiss Israel Dehydration Company Ltd. accounts for 80 to 90% of dehydrated vegetable production (carrots, onions, potatoes, peppers, and mixed vegetables), and Tapud Ltd. is the sole producer of frozen french fried potatoes. Most of these firms plan major investments in new equipment lines and processing techniques in the 1974-78 period.

Milos plans to invest $3 million in 1975-78 in an effort to increase citrus production capacity from 50,000 tons to 60,000 tons per year and to raise output of tomato products from 22,000 tons to 30,000 tons. During 1973, Milos invested over $1 million in new equipment, most of which was related to the development of a modern tomato processing system. Included in the 1973 purchases were

U.S.-origin cold storage equipment purchased from York Division of Borg-Warner Corp. and Inland Division of General Motors Corp.

Yakhin also plans to expand production capacity. Output in 1974 was 80,000 tons of citrus products and 6,000 to 7,000 tons of tomato products. Purchases of new equipment for 1974 through 1977 are projected at $2.5 million, with an additional $1.6 million to be invested in plant improvements.

Sunfrost has begun a $3-million investment program to improve cold storage and deep-freezing facilities. Rimon plans to spend some $260,000 a year in renewing equipment and adding new lines to expand production capacity. Rimon reportedly plans to purchase new centrifuges, conveyor systems, a palletizer, and materials-handling equipment, and has also expressed interest in aseptic filling systems. Other firms planning to increase their production capacity of Jafora, Pri Tnuva Agricultural Cooperative in Israel Ltd., Garden Frost Ltd., and Prize.

The principal processing innovation of recent years was Milos' introduction of specialized equipment for tomato processing. Other producers of processed tomatoes in Israel utilize citrus equipment and add only a minimum of special handling equipment for tomato products. Although aseptic processing systems have not yet been introduced in Israel, all the major fruit and vegetable processors have expressed interest in such systems. Further development of frozen food product lines is also considered important in the industry.

While quality, service, and delivery terms are weighed more heavily than price in determining equipment purchases for fruit and vegetable processing, manpower requirements are also a matter of concern. Labor shortages have made automated systems increasingly attractive, but Israeli trade sources indicate they are reluctant to automate more fully because of unstable raw material supplies and the reputed technical servicing difficulties experienced by owners of complex processing systems.

The juice processing operations of Yakhin Canning Company Ltd. illustrate the technology utilized in Israel's fruit and vegetable processing industry. Receiving, washing, and collating equipment items were locally made and have been in operation for 6 to 10 years; presses are from FMC of the United States. The liquid process utilizes a Sweco vibration filter manufactured in Belgium; U.S.-produced Mono pumps, Ladish centrifuges, and Rotary piston pumps; and stainless steel containers produced by Egmo of Israel. Pure juices pass through A.P.V. (United Kingdom) pasteurizers to FMC and Pfaudler (Belgium) filling machines; the sealing machines were made by Angelus Sanitary Can Machine Co. (United States), and the cooling system was manufactured in Israel by Negev. Juice containers are packed by New Way Packaging Machinery Inc. (United States) machines and labeled by Adams Dowel (United Kingdom) equipment. Sweetened juices are processed by 10-year-old Titan (Danish) centrifuges, Gaulin (Belgian) homogenizers, and A.P.V. pasteurizers; glass containers are washed by Dawson (United Kingdom) bottle washers and filled by Ortman und Herbst (German) equipment. Corking is performed by Albro (United Kingdom) machines and cabling by Kronseder (German) equipment. Cartons are packed by Enzinger (German) machines and labeled by Adams Dowel equipment.

Dairy products manufacturing.—Dairy industry sales in 1971 totaled $92.7 million and capital expenditures amounted to almost $3 million. Pasteurized milk production—157.3 million liters in 1972—increased at an average annual rate of 9% from the 1970 level. Yogurt and cheese output (40 million liters and 38 million liters, respectively, in 1972) increased even more rapidly, yogurt at an annual average of almost 15% and cheese at almost 10% from 1970 through 1972. Butter production was 2,650 tons in 1972.

The dairy industry comprises 24 enterprises; eight large firms, each with employment of more than 100 persons, account for most of the industry's production. The largest enterprise is Tnuva Ltd., Central Milk Division, a group holding company which operates five dairies and accounts for 85% of total milk products output. Other producers are United Dairies, Tene Noga, Strauss Dairies Ltd., and Tara; each of these supplies 3 to 4% of total production. Strauss is the leading manufacturer of ice cream, with 35% of sales; Whitman Ltd. ranks second with 25%.

Exceptional growth in equipment purchases is forecast for the dairy industry during the remainder of the 1970's. Several plant relocations are already planned, and the major manufacturers plan to modernize systems and expand production. Replacement demand also is expected to increase, since much of the equipment in use is fairly old (some 20 years or more) and a significant portion was obtained secondhand from larger domestic or foreign dairy plants.

Dairy operations located in the Tel Aviv area (United Dairies and one Tnuva dairy) are slated to move, and these relocations will entail considerable increases in investments in plant and equipment. All the Tnuva dairies plan capacity increases and new equipment purchases; Tnuva will also establish a wholly new plant for pasteurized milk at Rechovot. Strauss Dairies plans to invest $190,000 in 1975 and some $900,000 through 1978 for improvements in milk processing. An additional $500,000 is budgeted for ice cream processing improvements during the 1975-78 period; included will be purchases of a deep-freezing tunnel, molding machines, automatic packing machines, and equipment for cold storage rooms. At Whitman, most of the equipment was installed more than 20 years ago and was U.S.-manufactured and purchased secondhand. The firm plans to invest $500,000 through 1978 in new equipment, including an automatic molding machine, automated pasteurizing equipment, and deep-freezing equipment. United Dairies and Tene Noga plan installation of a new milk-sterilizing unit.

Quality and service are the prime factors influencing dairy industry equipment purchase decisions. Highly developed methods of handling dairy products are required in Israel's climate, and dairy industry purchasers are most interested in equipment that provides the most modern technological features at capacity levels suited to the Israeli market. Manpower shortages, chronic in this industry, are responsible for the growing interest in automatic systems. Dairy firms generally prefer automated equipment that does not require highly skilled personnel for operation. They are also concerned with servicing arrangements and spare parts supply.

Recent innovations in dairy operations include a highly sophisticated processing technique for milk powder production developed by Tnuva, and the introduction of two new yogurt products manufactured by Strauss under a licensing agreement with Gervais-Danone A.G. of Germany. Packaging techniques also have been modernized since 1970. Plastic bags for pasteurized milk were introduced in 1970 and there also has been experimental use of Pure-Pak packaging for sterilized milk.

Packaging materials used by the dairy industry in 1973 consisted of 5.5 tons of polystyrene packaging, 530 million plastic cups, and 450 million plastic bags; ice cream products required about one million units of paper packaging. Shortages of packaging materials have yet to provoke serious interest among dairy processors in multimaterial packaging equipment.

Meat, poultry, and egg processing.—Israel produced 14,625 tons of meat and poultry products in 1972, an increase of more than 2,000 tons over the 1971 level. Output in this industry grew by an annual rate of almost 20% from 1969 through 1972. Production for 1978 is forecast at 29,250 tons. Goose liver is the principal export; 160 tons were sold to other countries in 1973 and a 250-ton level is predicted for 1975. Substantial increases are planned for meat and poultry exports, with a wide variety of turkey products being developed for the export market.

Capital investments increased markedly during the early 1970's, climbing from $2.4 million in 1969 to an estimated $7 to $11 million during 1974. Continued high levels of investment are forecast for the remainder of the 1970's.

A total of 78 firms make up the industry; 65% of total output is supplied by 9 firms which produce 30 to 150 tons of meat and poultry products per month. Another 9 plants, producing 20 to 30 tons per month, account for 20% of output; the remaining 60 firms produce between 1 and 10 tons a month and contribute 15% of output. The larger companies are usually privately owned or are cooperatives; most of the small plants, generally those employing 25 or fewer persons, are privately owned with one or more of the owners working within the enterprise.

Government assistance has consisted mainly of support for research and development of new products for export, primarily turkey products. Technical assistance has been provided through the Food Technology Department of the Technion, which has assisted the industry in improving canning methods for meat products. In addition, financial aid for capital investments has been furnished to meat, poultry, and egg processing firms through the Fund for Industrial Development.

One of the largest manufacturers of canned meat products is Richard Levi Meat Products Ltd., which produces some 50 varieties of canned meats, sausages, and bologna. Hod Laven Ltd. also ranks as a major manufacturer; it presently accounts for about 8% of total output but is planning capital investments aimed at increasing sales by 50%. These plans include a new production line for turkey products, which will include deboning, grinding, and sausage-stuffing machines, and new lines for canned meat products. Packaging improvements are also planned by Hod Laven for handling fresh and frozen meat and poultry products.

Other major producers in this industry are Soglowek Naharia Sausage Factory Ltd., which established a new plant (with about 100 employees) in 1974 to manufacture turkey sausages mainly for export; Mizra Delicasies, producer of turkey and meat products and sausages under Swiss and German licensing arrangements; and Milouof (subsidiary of the Haifa Bay Settlements Development Company Ltd.), which received assistance from the Fund for Industrial Development to establish turkey-slaughtering facilities in 1974 and a new meat products plant during 1975. The firm Of Jerusalem Ltd. provides 27% of total processed poultry output and plans to purchase some $800,000 worth of equipment for a new plant for sausages, salami, smoked poultry products, and concentrated animal feed (derived from poultry scraps, feathers, and bones). Of Jerusalem reportedly is seeking to arrange licensing agreements with U.S. poultry products manufacturers.

The Army and Police department store chain, Shekem Ltd., operates a Kosher processing and packaging plant for fresh meat and turkey sausages, frankfurters, hamburgers, and other smoked meats; these products are sold in the chain's stores and canteens. Capacity increases have been planned for this plant.

Expanded production capacity is also planned by Madanei Dan Ltd. (current monthly production is 60 tons of sausages and frankfurters), Tiv Turkey Meat Salamis (to expand produce range), Iwago Company Ltd. (expansion began during 1973 with a new freezing pipe system and steam equipment) and Yechiam Meat Delicasies (new meat and turkey products for export).

The operations of a Hod Laven Ltd. plant, located in the Hadera Industrial Zone, are illustrative of processing technology in this sector. Production capacity is 3.5 tons a day (75% smoked meats and sausages, 15% ground meat, and 10% fresh meat and poultry). Most of the processing equipment is less than 2 years old. Conveyor tables and mixers were developed by Hod Laven; imported equipment includes cutters (supplied by Alpina, of Switzerland), slicing machines (Berkel Inc., United States) sausage stuffing machines (Vemag-Verdener Maschinen, Germany), and sawing machines (Linker Machines Inc., United States). Cooling and freezing equipment were produced in Israel by Askor, and vacuum packaging is done with German equipment produced by Multivag and Komet Maschinenfabrik.

Trade and Technical Regulations

Customs duties on food processing and packaging equipment range from 10 to 25%, with the higher rates applied to equipment similar to types also manufactured in Israel. In addition, there is a surcharge of 15% on all imported goods. Duties and the surcharge are based on the c.i.f. (cost, insurance, and freight) value. Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 5015, Main Commerce Building, Washington, D.C. 20230.

Electrical supply characteristics throughout Israel are 230 volts, 50 hertz, single-phase; in addition, 380 volts, 3-phase is available for heavy-duty equipment. The metric system of weights and measures is the statutory standard in Israel.

Information on the availability of pubilshed standards for food processing and packaging equipment in Israel may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Israel to supplement this report is available on a continuing basis from:

Country Marketing Manager—Israel
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-3752

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

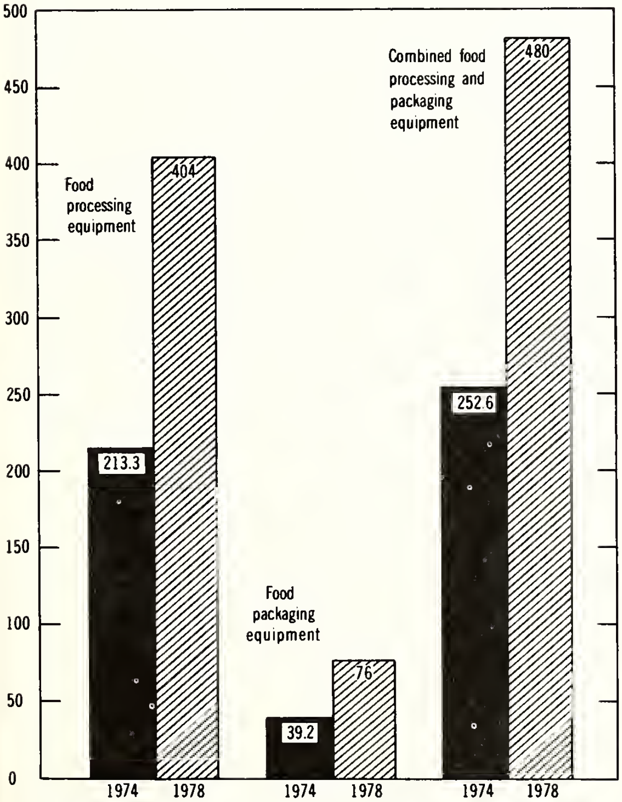
Please request: "The Market for Food Processing and Packaging Equipment in Israel," DIB-74-09-513, July 1974.

The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food Processing and Packaging Equipment—Israel" which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

Italy

The Italian Government is actively encouraging its fragmented food industry to consolidate its numerous small companies and simultaneously to expand production. The industry's purchases of food processing and packaging equipment, required in part to implement these changes, totaled $252.6 million [1] in 1974; this represented an annual increase of 18.7% over 1972 expenditures of $179.2 million. Trade sources predict that such purchases will grow at an average annual rate of 17.4% from 1974 to 1978, reaching $480 million in the latter year (see table 1).

Italy: Food processing and packaging equipment market, 1974 and 1978
(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Italian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Greater consumer demand for precooked and frozen foods is contributing to rising sales of *food processing equipment,* which grew from $149.2 million in 1972 to $213.3 million in 1974. Industry sources now foresee 1978 sales topping $400 million, based on an anticipated 17.3% average annual gain. Imports of food processing equipment are expected to increase from $59.4 million in 1974 to nearly $75 million in 1978. Purchases from the United States in 1974 totaled $1.9 million, or about 3.2% of total imports, and should reach $2.4 million in 1978.

Food packaging equipment sales grew an average 14.3% yearly between 1972 and 1974, rising from $30 million to $39.2 million, as Italian consumers turned to more self-service shopping and individually packaged food items. Demand for packaging equipment is expected to accelerate because of Government and industry efforts to improve the extremely fragmented food distribution system. An average annual market growth of 18% is projected between 1974 and 1978, resulting in sales of $76 million in the latter year. The United States supplied $1.5 million (or 5.7%) of the $26.3-million Italian import market in 1974. The country's food processors are expected to import packaging equipment valued at nearly $34 million in 1978, spending almost $2 million for U.S. products in that year.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: U.S. $1.00 = 620 lire (1971); 583 lire (1972); 583 lire (1973); 650 lire (1974 and subsequent years).

Italy—Economic Indicators
(1973)

Gross national product:	**$138.5 billion**
Total country imports:	**$27.9 billion**
Imports from U.S.:	**$2.3 billion**
Total country exports:	**$22.3 billion**
Exports to U.S.:	**$1.9 billion**
Population:	**55 million**

Competitive Environment

A few Italian manufacturers produce highly sophisticated, large-scale food processing systems that have gained worldwide reputations for excellence. However, most processing and packaging equipment makers operate small plants and produce machinery designed for limited production runs. The country's food processors therefore are dependent on foreign suppliers for most of their needs for technologically advanced systems and specialized equipment. Increasing construction of larger plants in the food processing industry probably will lead to increased demand for imported machinery.

A profile of U.S. industry's competition from Italian and third-country suppliers active in this market follows.

Food processing equipment.—Italian manufacturers provide processing equipment to all sectors of the food industry. They excel in the production of macaroni-making equipment, confectionery machinery, and some units for making ice cream, and are able to supply these items at a lower cost than their foreign competitors.

The domestic food processing equipment industry comprises over 700 companies: 146 firms manufacture equipment for the wine and alcoholic beverages industry; 83 produce items for fruit and vegetable processing; 82 supply meat processing machinery; 80 make equipment for the bakery products industry; and 74 firms make vegetable oil processing machinery. Industry production generally exceeds internal demand, and several major manufacturers export over 50% of their output, often to more sophisticated markets, including the United States.

Most of the local food processing equipment producers are Italian-owned firms, although a few important companies are subsidiaries of foreign firms. Buhler Fratelli S.p.A., controlled by the Swiss company Buhler, is a major producer of grain mill and confectionery equipment. A subsidiary of the Swedish firm, Alfa-Laval AB, makes dairy systems. Two U.S. affiliates are also among the larger Italian firms: Padovan (FMC Corporation) makes winemaking apparatus, and Foodice (W.R. Grace & Co.) produces ice cream-making units.

One of the most important Italian-owned manufacturers is Bertuzzi S.A., which makes equipment for the fruit and vegetable, fats and oils, winemaking, and milk processing sectors. Rossi Ing. e Catelli manufactures units for preserving tomatoes, freeze-drying vegetables, and pasteurizing milk. Fats and oils processing equipment is made by Pieralisi Macc. Agricole Ind. li. S.p.A., Giorgio Diefenbach, and Gianazza Fratelli S.p.A.; the latter firm also produces winemaking apparatus. Carle & Montanari is a major producer of chocolate and candy-making machinery. Both M. Sordi and Gino Frau are important makers of dairy products manufacturing equipment; Dott. Ingg. Braibanti S.p.A. is the largest manufacturer of pasta-making equipment; and Vettori-Manghi e C. S.n.c. makes fruit and vegetable processing units. Bakery products machinery is built by Polin and Imaforni.

The leading foreign source of food processing equipment is Germany (see table 2), whose products are considered by Italian consumers to have technological capabilities comparable to those of U.S.-made equipment. Germany's market position is strongest in the sugar, meat, and beer sectors. Denmark, Sweden, and the Netherlands command large shares of the Italian milk-processing equipment market. Firms located in Belgium and the United Kingdom are major equipment suppliers to the bakery products sector; Swiss companies are known for chocolate-processing machinery, and French and Spanish manufacturers supply winemaking units.

Swiss and German products are made more at-

Table 1.—Italy: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	10.9	16.3	55
Dairy	23.9	27.3	34
Fruit and vegetable	28.0	30.6	54
Sugar and confectionery	4.4	4.9	6
Fats and oils	38.1	44.4	68
Other sectors	90.4	89.8	187
Subtotal	195.7	213.3	404
Food packaging equipment			
Forming, filling, sealing	23.9	21.6	38
Wrapping, packing	8.1	10.2	19
Marking, inspecting	5.0	5.9	15
Container/product/package preparation and handling	1.6	1.6	4
Subtotal	38.6	39.3	76
Total food processing and packaging equipment	234.3	252.6	480

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Italian trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Italy: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-73

(in thousands of U.S. dollars)

Food Processing Equipment	1971	1972	1973
Bakery and pasta processing equipment			
United States	17	30	391
Germany	1,261	1,747	1,760
United Kingdom	295	331	1,707
France	110	144	542
Others	391	625	934
Total	2,074	2,877	5,334
Confectionery production machinery			
United States [1]	54	91	104
Germany	457	927	1,103
United Kingdom	4	420	424
The Netherlands	53	77	181
Others [1]	127	274	273
Total	695	1,789	2,085
Meat processing equipment			
United States	80	162	353
Germany	914	918	1,036
The Netherlands	392	809	770
France	99	131	113
Others	211	396	404
Total	1,696	2,416	2,676
Bakery industry furnaces and ovens			
United States	132	1	234
Germany	1,587	3,208	2,369
France	657	1,027	1,029
Austria	9	84	187
Others	117	204	271
Total	2,502	4,524	4,090

	1971	1972	1973
Industrial refrigerating equipment [2]			
United States	1,520	1,768	1,985
Belgium-Luxembourg [1]	354	645	1,100
France	437	677	869
Germany [1]	239	566	538
Others [1]	232	456	496
Total	2,782	4,112	4,988
Packaging Equipment [3]			
Machines for cleaning, filling, and sealing bottles and containers			
United States [1]	1,215	500	547
Germany	4,612	6,713	8,565
Sweden	1,363	1,816	3,990
France	1,016	599	1,647
Others [1]	1,906	1,808	3,504
Total	10,112	11,436	18,253
Machines for canning, wrapping, packaging, sealing, labeling, etc.			
United States	622	1,152	1,562
Germany	4,226	5,152	8,314
France	399	769	1,232
Switzerland	684	1,550	1,166
Others	991	2,100	2,464
Total	6,922	10,723	14,738

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[1] 1973 figures estimated.

[2] Since Italian official trade statistics do not differentiate between processing equipment for food and non-food uses in this equipment category, both types of equipment are included in these figures.

[3] Since Italian official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Italian trade sources to account for 65% of total packaging equipment imports in 1971; 70% in 1972; and 70% in 1973.

Source: Instituto Centrale di Statistica (ISTAT) publications for 1971, 1972, and December 1973 cumulative data.

tractive by the assurance of technical assistance, while Spanish equipment generally is lower priced. The market position of some suppliers such as Alfa-Laval and Buhler is enhanced by their well-established Italian subsidiaries.

Italian sugar and confectionery producers buy crystallizing apparatus, purifiers, and juice extractors from such German companies as Bauermeister, Winkler & Dunnevier, Hessler, Buckau-Wolfe, and Putsch. Suppliers of separators, centifuges, and pasteurizers for the dairy industry include Westfalia Separator AG of Germany, Kustner of Switzerland, Paasch & Silkeborg of Denmark, and A.P.V. Co. Ltd. of the United Kingdom.

Alexander Werke of Germany and Stork of the Netherlands are important suppliers of meat processing equipment, such as mixers and continuous sterilizers. Winkler & Dunnevier of Germany furnishes continuous ovens, and Ooms of Belgium and Baker Perkins of the United Kingdom sell other bakery products equipment. The fats and oils sector is supplied by Schroeder & Lurgi of Germany, and Kustner.

Food packaging equipment.—Most of the Italian food packaging equipment market is supplied by foreign manufacturers. Germany is the leading supplier, followed by France, Sweden, Switzerland, the United Kingdom, and the Netherlands. Some of the major companies selling in Italy are Otto Hansel, Benz and Hilgers, Werner & Pfleiderer, and Multivac of Germany; SIG and Kustner of Switzerland; and Stork of the Netherlands. The British firm,

Table 3.—Italy: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1971*

Sector	Large	Medium	Small
Meat, poultry, and eggs	9	42	3,275
Dairy	5	46	3,044
Fruit and vegetable	4	65	997
Grain	—	5	8,348
Bakery	8	30	16,388
Sugar and confectionery	11	71	580
Fats and oils	2	21	5,931
Beverages	3	90	4,706
Fish and seafood	—	9	239
Miscellaneous food products	6	67	4,692

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[1] Large = 501 or more employees. Medium = 101-500 employees. Small = 100 or fewer employees.

Source: *Quinto Censimento Generale dell'Industria e del Commercio, 25 October 1971—Vol. 1,* Unita Locali e Addetti, Rome, 1972.

Baker Perkins, supplies wrapping and packaging machinery and Virey Garnier of France sells labeling machines.

The domestic food packaging equipment industry consists of over 200 companies, most of them small, artisans' shops. Their best known products are general-purpose packaging machines that are technologically sound and economically priced. Foreign subsidiaries are of relatively minor importance. The largest ones, all affiliated with U.S. firms, include AMF Sasib (American Machine & Foundry Co.), a producer of wrapping machinery, and Hayssen Europa (Hayssen Mfg. Co.), which manufactures filling, wrapping, and bagging equipment. Grace Italiana (W.R. Grace) produces vacuum packaging and wrapping machinery, and ACMA (Emhart Corporation), makes wrapping, filling, and vacuum packing systems.

Some of the major Italian-owned companies are Lovati e C. S.p.A., which makes wrapping, boxing, can-sealing, and bottling equipment; Thermoforming, a producer of filling, vacuum packing, and bottling equipment; and V.e.C. Tonazzi, S.r.l., maker of filling, boxing, and bottling equipment. Wrapping, bottling, and aerosol-filling equipment is manufactured by Dizma S.n.c., and can-making machinery is produced by Cevolani S.p.A. Other wrapping apparatus is made by Cavanna, OCME Off. Constr. Mecc. S.r.l., OTEM S.p.A., B.T.B., Tito e Figli Manzini S.p.A., Garibaldo Ricciarelli S.a.s., and Gaetano Buscetto. Wrapmatic S.p.A. makes boxing devices. Luigi Goglio Milano S.p.A. recently introduced a flexible, multilayer pouch featuring a plastic valve for bleeding gases produced by roasting coffee without admitting outside air.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find favorable opportunities for sales of the following types of equipment to the Italian food processing industry.

Food Processing Equipment

Fats and oils.—Margarine-making churns.

Meat, poultry, and eggs.—Molding machines/presses; poultry defeathering and eviscerating equipment; frozen meat flakers/slicers/cubers; boning machines; cooling/freezing equipment; sawing machines; dehairing machines; rendering equipment; bone choppers; gutting machines; power cleavers; slaughtering equipment; liquid nitrogen tunnel freezers; sterilizing systems.

Fruit and vegetable.—Abrasive peelers; chemical peelers; continuous blancher/cooker/cooler/sterilizer systems; cooling/freezing equipment; pressure destoners; vacuum destoners; juice extractors; apple-processing systems; sterilizing systems.

Dairy.—Pasteurizers; cheesemaking machines.

Sugar and confectionery.—Chewing gum equipment; enrobing machines; crystallizing apparatus; tabletting machines.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquids, dry products, viscous products, and solids; vacuum form/fill/seal systems; vacuum thermoformers; injection blow molders; extrusion blow molders.

Wrapping, packing.—Shrink-wrappers and tunnels; multipackers.

Marking, inspecting.—Labelers; check weighers; coding equipment; metal detection equipment.

Container/product/package preparation and handling.—Palletizers; stackers; unscramblers.

The research survey also indicates that the following U.S.-made products are in strong demand in other sectors of the food industry: biscuit/wafer/cracker and biscuit-filling machines; fish filleting, fish scaling, seafood shelling, and fish grinding machines; and potato chip and corn-popping machines.

The Food Processing Industry

The Italian food processing industry is made up primarily of small firms that use a great deal of manual labor. In 1971, only 48 plants employed more than 500 people, while 99% of the nearly 48,700 establishments had fewer than 100 workers (see table 3). Capital expenditures by all enterprises with more than 20 employees totaled $248 million, and sales topped $7 billion (see table 4). According to data presented in a 1973 Mediobanca publication, the 42 major companies that accounted for more than 40% of the industry's sales in 1971 experienced a 27% growth in sales and a 32% increase in capital investment in 1972.

Changes in consumer tastes and government pressure to satisfy the country's food needs without upsetting the balance of payments are leading to extensive modifications in the Italian food industry. Food packaging has become much more important with the spread of self-service shopping and the trend away from bulk buying. Shortages of raw materials, particularly wood for the manufacture of paper and cardboard, are affecting the kinds of packaging materials used. Plastic in its various forms is being adopted by many sectors, although the beverage industry expects to continue catering to the Italian preference for drinks in glass bottles; only soft drinks have sold well in aluminum cans.

Generally improved living standards have brought other shifts in customer demand. More money is being spent for convenience foods and precooked dishes, and the market for meat and meat-based products has multiplied. Frozen food, practically unknown when freezers were scarce at both the retail and the consumer levels, is being purchased in ever-growing quantities. Sales of industrial refrigeration and quick-freezing equipment, which amounted to $18 million in 1973, are rising.

Partly to avoid price controls and partly to satisfy the demand for new types of edibles and more meat, food producers have been importing large amounts of agricultural products. The Government has reacted to this with plans for upgrading the food industry during at least the next 5 years. Consolidation, which reduced the number of plants by 2,500 between 1961 and 1971, will be speeded up. The giant State-controlled food companies, Alimont and the Societa Meridionali Elettricita (SME), were merged in June 1974. In the same year, Ente Partecipazioni e Finanziamento (EFIM), a quasi-Government holding company with representation in all segments of Italian industry, was given $330 million for expanded financing in the meat, seafood, fruit and vegetable, and wine production sectors and the foodstuff distribution system.

Many companies are expanding their operations or setting up new plants in the Mezzogiorno region in order to benefit from Government efforts to strengthen the economy of southern Italy. Financial incentives include Government provisions of 5 to 35% of sinking funds, and low-interest loans covering 30-50% of the total financing requirement. Low-interest, 5-year loans are available for up to 70% of the price of all machinery and equipment costing under $154,000.

The five sectors of Italy's food industry that are expected to offer the best sales opportunities to manufacturers of food processing and packaging equipment over the next 5 years are reviewed in greater detail below.

Fats and oils processing.—Industry sources indicate that fats and oils processors in 1973 invested $43 million for equipment, which was more than any other sector in the Italian food industry. These companies produced 861,000 tons of vegetable oils and margarine in 1970 and raised their output to 945,000 tons in 1972. Olive oil production increased 18% from 430,000 tons to 507,000 tons in the same 2-year period, while margarine output climbed 24%—from 38,000 tons to 47,000 tons.

Table 4.—Italy: Basic data on food processing industry sectors,[1] *1971*
(values in millions of U.S. dollars)

Sector	Sales by manufacturing establishments	Production (in thousands of tons)	Capital expenditures
Meat, poultry, and eggs; fruit and vegetable; fish and seafood	1,582	2,170[2]	41
Dairy[3]	751	4,287	12
Grain	1,314	8,047	22
Bakery and confectionery[4]	842	1,663[5]	34
Fats and oils	537	944	8
Beverages	1,181	n.a.	59
Sugar and other food products	849	1,567	72

[1] Companies with fewer than 20 employees are excluded.

[2] Apportioned as follows: meat and poultry, 625; fruit and vegetable, 1,474; fish and seafood, 71.

[3] Excludes ice cream.

[4] Includes ice cream.

[5] Apportioned as follows: bakery, 297; confectionery products, 1,366.

Source: *Il Prodotto Lordo, 1971,* ISTAT April 1973; *Le Prospettive dell' Industria Italiana, 1972-1975,* Confindustria, Sevizio Studie Rilevazioni No. 28; Associazione Italiana Industriali Prodotti Alimentari and Associazione Italiana Latteo Casearia.

The sector's five largest companies account for approximately 30% of the country's total olive oil output. These are Bertolli (controlled by SME-Alimont), Costa Giacomo fu Andrea S.n.c., Chiari e Forti, Italiana Oli e Risi S.p.A. (of the Ferruzzi Group), and Star (of the SME-Alimont group). Over 50% of the margarine is made by one firm, Van der Bergh, a division of Unil-It S.p.A., which is a subsidiary of a Netherlands firm, Unilever. Star is the second largest margarine producer.

The number of plants declined by nearly one-third between 1961 and 1971, and consolidation and expansion of facilities are expected to accelerate considerably in the near future. Sara-Silca plans to build a $5.5-million, medium-size plant in Puglia. Both Costa and Dante are setting up new 70-man plants. Trade sources predict strong growth in margarine sales; Van der Bergh plans to increase its margarine output by as much as 300% within the next 5 years.

Spokesmen for the large companies anticipate more widespread use of automation in fats and oils processing; they are satisfied with present levels of automation in the packaging operations. The most advanced technology in the sector involves the production and packaging of margarine. Van der Bergh's system uses caustic soda and fuller's earth to neutralize and bleach refined soy, coconut, or palm oil. The oil is hydrogenated in the presence of a nickel catalyst; then the fuller's earth and the catalyst are removed in a Manusardi filter press. The hydrogenated oil is fed into a Gianazza continuous deodorizer, where steam distillation takes place in a vacuum. Other ingredients are added to the bland oil and the mixture is emulsified, chilled, and textured in a Unilever-designed unit called the Merksator, which consists of chromium-plated steel tubes externally cooled by ammonia. The margarine is fed through two Benz & Hilgers packaging machines, each capable of filling and sealing 80 cups a minute. Van der Bergh uses 200-gram, thermoformed polystyrene cups with thermosealed polystyrene tops. The filled cups are put into boxes by a Zamboni cartoner and prepared for delivery.

Meat, poultry, and egg processing.—Meat processing is the fastest growing sector in the Italian food industry. Production of meat and poultry products expanded from 640,000 tons in 1970 to 680,000 tons in 1972, supplying about 50% of the Italian consumption. The volume of precooked meat-based dishes has been increasing rapidly in the past few years and in 1972 reached 13,000 tons, more than double 1970's output of 5,800 tons. Production of precooked beef- and pork-based dishes more than tripled, rising from 3,300 tons in 1970 to 10,000 in 1972; output of chicken, rabbit, and turkey dishes increased about 9.5% yearly.

Italy imports some 600,000 tons of meat, mostly beef, each year. The Agriculture Ministry is trying to satisfy internal demand with domestic production and has allocated $472 million over the 1974-79 period to expand the country's cattle-raising activity. The Government has also set aside funds through EFIM, to help raise the technological level of the industry. With very few exceptions, manual labor is widely utilized in meat processing, especially in the cleaning and cutting operations.

Five large companies process beef and pork. The 1972 sales of Vismara Francesco, a sausage producer, approached $55 million. Citterio's sales of preserved meats totaled $24 million. The other major firms are Molteni; Negroni Pietro S.p.A., a sausage maker; and Galbani S.p.A., prominent in production of stuffed meat as well as in the dairy industry.

Over 75% of the country's canned meat is supplied by Simmenthal S.p.A., which had $54.9 million in sales in 1972. Other major canned meat producers include Ascal Montana (accounting for 8% of the market); Manzotin, a member of the Trinity Alimentari group (7%); and Star (5%).

Societa Italiana Prodotti Arena (SIPA) and Cip-Zoo, an affiliate of Bibby and Sons (United Kingdom), together processed 90% of Italy's output of chicken, turkey, and duck products in 1972. Cip-Zoo's 1972 sales exceeded $62 million, while SIPA's sales reached $41 million.

Cipas and Star, both members of the SME-Alimont group, are the leading manufacturers of precooked meat-based dishes. Star entered the market first with its Cuoco Mio brand; Cipas, a catering market specialist, has extended its product range to include over 250 dishes.

A number of expansion or modernization projects are planned for the sector in the near future. Campagnolo hoped to complete its new plant in Piobesi by mid-1975. Excluding costs for slaughtering facilities, expenses for machinery and equipment alone are expected to exceed $1 million; planned capacity for the plant is 300 tons per week. Fratelli Schellino is building a new packing plant in Formigliana to increase output from 100 to 500 tons per week. The facility should be completed in 1976 and will require $3.8 million worth of machinery and equipment.

Several companies are expanding into the Mezzogiorno area. Balzarini Corvi intends to build a $1.5-million plant in Puglia. Casearia Valle del Sacco expects to build a new $630,000 plant in Lazio, and Sicilcarni plans a $540,000 establishment in Sicily.

Relatively advanced techniques are applied in meat packaging operations. Vacuum packaging in plastic pouches has become common for hot dogs and sliced sausages. Research and development efforts are aimed at upgrading existing products, improving the meat package, and developing a greater range of precooked meat-based dishes. All the major food groups (SME-Alimont, W. R. Grace, and Winefoods) anticipate substantial expansion of their precooked food lines. Most meat processors view automation as feasible only for packaging and remain skeptical about its usefulness in processing.

Representative of Italy's meat packers is Ital-Wurst S.r.l., a medium-size producer of sausage that recently added $500,000 in machinery and equipment to its facilities at Turin. The company's new line is expected to boost production from 1,000 to over 2,400 items per hour and reduce manpower from 7 to 2 workers. The system feeds meat into a German-made automatic grinder where it is thoroughly mixed in a vacuum. Then a pump moves the mixture into an automatic stuffing machine, which stuffs it into a continuous cellophane hose. The sausage enters a Dutch-made (Linker) drying-smoking oven where it is cured for a prescribed time at a controlled temperature. Both time and temperature may be adjusted to fit the product. From the oven, the meat-stuffed hose is carried by conveyor to an automatic cutter which divides it into appropriate lengths. The finished product is automatically moved to pallets in refrigerated storage cells to await delivery.

Fruit and vegetable processing.—Demand for frozen foods and baby foods is growing rapidly in

Italy, and domestic processors are increasing their production capacity accordingly. Between 1970 and 1972, output of frozen fruits and vegetables increased 43%, from 14,000 to 20,000 tons, and the volume of baby foods rose 25%, from 80,000 to 100,000 tons. Production of the entire sector remained at 1.5 million tons per year from 1970 through 1972 and rose to 1.8 million tons in 1973.

Canned vegetables, fruits, and fruit juices are manufactured by approximately 450 companies. The four leading firms, Cirio, De Rica, and Star, all of SME-Alimont, and Arrigoni, supply over 25% of the market.

Over 85% of Italy's output of frozen vegetables and fruit is produced by Fridodaunia (an EFIM member), Surgela (SME-Alimont), and Sages-Findus (Unil-It). Liebig, a subsidiary of Liebig's Extract of Meat Ltd. of the United Kingdom, is the major processor of dehydrated and freeze-dried soups. Almost all of the country's output of baby foods is produced by a few companies; by far the largest is Plasmon S.p.A., an affiliate of the American firm, H. J. Heinz. Other baby-food processors include Buitoni; Mellin (SME-Alimont); and Monda and Gerber, two divisions of Mona Knorr, a subsidiary of Corn Products in the United States.

Several companies are setting up new production units in Sicily. Centro Agrumario intends to invest $2.3 million in a plant that will employ 200 persons. Lioprodal's new installation will require 40 workers and will cost an estimated $2.1 million. Fiorino plans to spend $812,000 for a plant employing 55 persons. Albano Luigi will be building a 30-man establishment in Puglia at a cost of $231,000, and Centrale Orto Frutticola will expend $154,000 for new construction at Abruzzo. Fridodaunia and Surgela also hope to expand into the Mezzogiorno, but plans have not been finalized.

The newest technique to be adopted by the fruit and vegetable processing industry is freeze-drying, which Mellin is using for baby foods and several Sicilian firms have applied to citrus fruits. Industry sources do not foresee any major changes in canning operations; nevertheless, major efforts are being directed toward finding a suitable substitute for the conventional can, in view of increasing costs and an anticipated shortage of tinplate.

An advanced tomato concentrate production line designed by Rossi Ing. e Catelli has been installed at the Rolli plant near Parma. The continuous system can process 330 metric tons (MT) of fresh tomatoes per day and produces a daily maximum of 55 MT of double concentrate or 41 MT of triple concentrate. Fresh tomatoes are washed in tanks, inspected on a conveyor belt, and fed to a chopper. Then they are treated under controlled temperature conditions and processed in a pulper/finisher. The fresh tomato juice is collected in a tank. Further processing takes place in the Double-Effect DFF Evaporator Reverse Flow, the key component of the system. Careful design of the evaporator and special technical features allow nonstop operation for 20 days between cleanings. The concentrate produced in the evaporator is passed through a sterilizer by a variable-speed volumetric pump. An automatic sealer, built by the Angelus Sanitary Can Machine Co. (a U.S. firm) and capable of 450 strokes per minute, seals the cans. In many applications the less expensive Italian Mecfond automatic seamer is used. Cans are water cooled to 35° C and then air dried.

Dairy products manufacturing.—Dairy industry production in 1971 totaled 4.3 million tons, or roughly 50% of the amount of milk and dairy products consumed by Italians that year. Total consumption advanced from 8.2 million tons in 1970 to 9.3 million tons in 1972. During this period, annual retail milk consumption grew from 3.4 million to 3.8 million tons.

Output of cheese by Italian processors rose from 395,000 tons in 1970 to 423,000 tons in 1972, and butter production increased from 53,000 tons to 61,000 tons. The yearly volume of condensed and evaporated milk remained steady at 18,000 tons, and ice cream production averaged 124,000 tons annually during the 1970-72 period.

Milk cooperatives are important in dairy production. The largest of these are Latteria Casearia di Soresina, Latteria Cooperative Riunite, Consorzio Latteria Sociali Mantovane, Caseifici di Modena, Consorzio del Burro Val di Parma, and Polenghi Lombardo.

The SME-Alimont group is a major producer of sliced processed cheese. The cheese sector's largest private company, Galbani S.p.A., has a daily output of 150 tons. Other important cheese producers are Invernizzi, Salp and Ala of the Marzotto group, and Locatelli S.p.A. of the Nestle group. The principal ice cream manufacturers are Sages and Algel Findus S.p.A., both of the Unil-It group, and Motta and Alemagna of SME-Alimont; also important are Tanara of W. R. Grace; Sanson, S.p.A. of Beatrice Foods; and Toseroni S.p.A. These large companies hold no more than 30% of the total cheese sales but supply more than 70% of the ice cream market.

The dairy industry uses a two-layer paper-polythene laminate for about 85% of its butter wrapping. However, the major manufacturers have adopted two-layer aluminum greaseproof paper and coated aluminum. Expanded polystyrene cups for carryout ice cream are rapidly replacing paraffined cardboard.

Dairy producers are looking for ways to increase packaging speed and to improve existing packaging techniques. Galbani was the first to install a system to mechanize production of gorgonzola and fresh mozzarella cheeses. The mozzarella processing system, devised by M. Sordi, consists of three basic components: Polimec, Policurd, and Reinform. The Polimec, a double- jacketed coagulation vat, subjects the curd to controlled fragmentation. The curd is moved through a large-diameter hose to the Policurd drainage vat where it is prepressed and portioned. The curd is then transferred to ripening vats and to the Reinform. The ripe curd is fed through a hopper into a curd mill and then moved into a stretching machine where it is mixed with a variable flow of water at a controlled temperature. It is then extruded in a cylindrical form, shaped into an individual cheese portion in a molding device, and discharged into a cooling tank. The system can produce 750 tons of cheese per day.

Sugar refining and confectionery manufacturing.—Sugar production grew from 1.1 million tons in 1970 to 1.2 million tons in 1972. Output of sugar-based products rose from 130,000 to 134,000 tons, while chocolate products output increased from 72,000 to 75,000 tons in the same period.

In 1972, Eridania S.p.A., of the Monti group, held 35% of the sugar market. The Montesi group, which includes Societa Generale Zuccheri and Societa Italiana Zuccheri, held 25% of the market and sold products valued at $137 million. The Maraldi group—Zuccherifici di Volano, Sfir, and Romana Zucchero—had sales totaling some $60 million, accounting for 15% of the sugar sold. Other sugar refiners are Zuccherificio Sermide and Sadam S.p.A. of the Maccaferri group.

Alemagna S.p.A. (a member of SME-Alimont) leads in the production of candy stacks, holding about 60% of this market; Perfetti S.p.A. accounts for about 80% of Italy's chewing gum output. The other major candy producers are Ferrero, Industria Dolciaria; Industria Buitoni Perugina S.p.A.; Elah S.p.A.; and Dufour S.p.A. Altogether, these six firms accounted for roughly 40 to 45% of the total hard-candy/chewing gum market.

Ferrero and Perugina also supply over 50% of the market for chocolate products; Venchi Unica provides some 15 to 20%. Other major companies in the chocolate sector include Alemagna, Pernigotti S.p.A., and Motta S.p.A.

One Italian candy manufacturer has started research on a new enzyme-based processing system that would reduce the curing time of chocolate from 24 hours to 3 hours. New advances in packaging include the increased use of such new materials as cellophane-propylene, aluminum-propylene, and cellophane-aluminum. Manufacturers of hollow chocolate products are testing an inner wrap made of atoxic thermoformed PVC that is expected to be less expensive and to permit higher packaging speeds. Industry sources indicate that automation and the consequent reduction in manpower are management's major concern.

Trade and Technical Regulations

Food processing and packaging equipment is imported duty free from the five other original members of the European Economic Community. Denmark and the United Kingdom pay from 4 to 8.8% of the c.i.f. price on goods that are charged from 5 to 11% when imported from the United States and other General Agreement on Tariffs and Trade (GATT) members. Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

Italy's electrical supply is primarily 220 volts, single-phase, 50 hertz. Industrial power is also supplied in 380 volts, 3-phase. Italy uses the metric system for weights and measures.

Food processing equipment parts that contact food must meet materials standards; stainless steel and/or steel coatings are acceptable. Every machine must comply with the regulations established by the Ente Nazionale Prevenzione Infortuni and the Commissione Elettrotecnica Italiana. Information on the availability of published standards for food processing and packaging equipment in Italy may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Italy to supplement this report is available on a continuing basis from:

Country Marketing Manager—Italy
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-3944

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in Italy," DIB 74-12-509, July 1974.

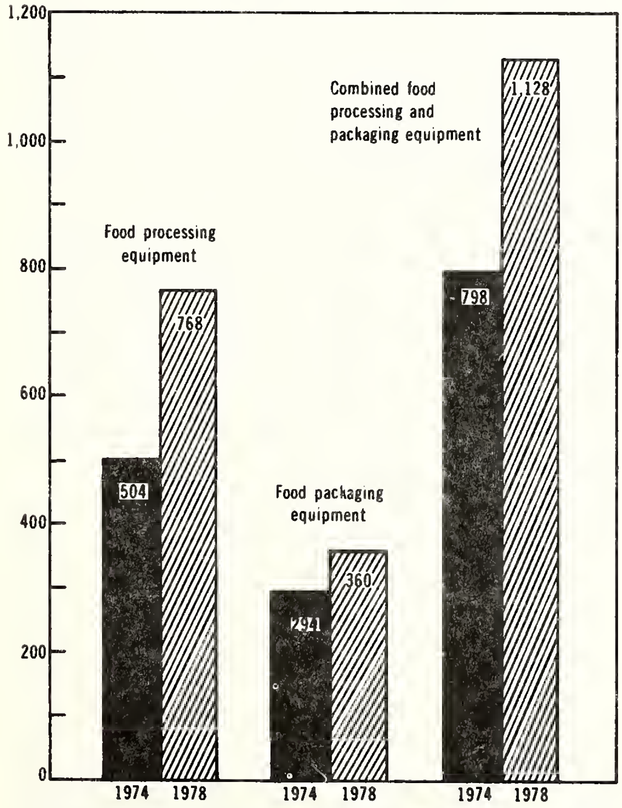
The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food Processing and Packing Equipment—Italy" which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

Japan

The changing lifestyles and increasing dietary sophistication of Japan's consumers, characteristic of the country's continuing modernization, are contributing to significant expansion of the local food processing industry. These trends are expected to boost the Japanese market for food processing and packaging equipment to more than $1 billion [1] in 1978, representing average annual growth of 9% from the 1974 market level of just under $800 million (see table 1). Total sales in 1974 were almost 30% higher than in 1972, when the market was valued at $616 million.

Japan: Food processing and packaging equipment market, 1974 and 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Japanese trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Rising personal incomes, fostering a shift away from traditional patterns of food consumption, coupled with government programs favoring an increased intake of animal protein, are heavily influencing sales of *food processing equipment.* The market for such equipment exceeded the half-billion dollar mark ($504 million) in 1974, up from $371 million in 1972. Sales are projected to approach $770 million in 1978, representing an average annual increase of 11% for the 1974-78 period.

The anticipated heavier demand for "western-style" food products, such as processed meats, breadstuffs, soft drinks, and convenience foods, should boost food processing equipment imports 10% annually—from $29 million in 1974 to $43 million in 1978.

The U.S. share of these imports, which amounted to 30% ($8.7 million) in 1974, is forecast to increase to about 35% ($15 million) in 1978. The recent entry into Japan's food processing industry of large conglomerates with sizable, vertically integrated operations should provide a growing market for the high-capacity equipment generally offered by American firms.

The *food packaging equipment* market is projected to expand at an average annual rate of 5.2%—from $294 million in 1974 to $360 million in 1978. Sales in 1972 amounted to $245 million. Trends within the industry that are affecting equipment requirements include the aforementioned popularity of convenience foods, widespread utilization

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1.00=351 yen (1971); 308 yen (1972); 273 yen (1973); 300 yen (1974 and subsequent years).

Japan—Economic Indicators
(1973)

Gross national product:	**$416 billion**
Total country imports:	**$32.5 billion**
Imports from U.S.:	**$9.3 billion**
Total country exports:	**$36.2 billion**
Exports to U.S.:	**$9.5 billion**
Population:	**108.7 million**

of prepackaging systems by supermarket chains, the developing practicality of automation, and shifts in the use of packaging materials.

The escalating demand for advanced food packaging systems (especially laborsaving machinery) indicates good import growth potential because domestic machine manufacturers offer little such equipment. Imports therefore are projected to increase more rapidly than overall sales, achieving an average annual increase of about 8%—from $19.7 million in 1974 to $27 million in 1978.

American-made packaging machinery is well received in the Japanese market because of its high-performance and safety features. Sales of U.S. food packaging equipment amounted to $6.3 million in 1974, comprising 32% of the import market. The U.S. share of imports may dip slightly in 1978, to about 30%, in view of intensified domestic and European competition; this percentage share would represent a sales volume of $8 million for American manufacturers in that year.

Competitive Environment

Most of the standard food processing and packaging equipment sold in Japan is of domestic origin, but the specialized, high-capacity, and advanced types of machinery are predominantly imported. This pattern is expected to prevail during the next several years.

A review of the domestic and third-country competition faced by U.S. manufacturers in the Japanese market for food processing and packaging equipment is presented below.

Domestic manufacture.—A burgeoning national demand for processed foods has prompted Japanese equipment manufacturers to expand and broaden their lines of food processing and packaging equipment, so that they currently supply over 90% of the total domestic market. Domestic firms offer a wide range of modern baking, confectionery, milk products, and meat processing and packaging equipment, in addition to rice and barley polishing, noodle manufacturing, sake (wine) brewing, and other processing machinery for traditional foods.

Approximately 1,300 enterprises produce processing equipment and 200 produce packaging equipment for the food industry. Some 85 of the former and 115 of the latter are considered significant suppliers. Although small- and medium-size firms are typical, some of the country's powerful industrial groups are also represented in this industry, particularly in the production of packaging equipment. The larger firms frequently manufacture under foreign licenses.

Direct foreign investment in the industry consists of 14 joint ventures—4 in processing equipment production and 10 in the manufacture of food packaging equipment. U.S. manufacturers currently are assisting two prominent Japanese paper and printing companies in penetrating the packaging equipment industry. Rheem International Inc. is collaborating with the Honshu Paper Co. Ltd. in the manufacture of automated packaging equipment. Avery Products Corp. and Mead Packaging International Inc. have developed joint ventures with the Toppan Printing Co. Ltd.—the former for labelers and the latter for Prime Pack machines.

Considerable investment inflow is expected to follow the removal of restrictions, scheduled for May 1975, on foreign capital in the packaging industry. AMF and FMC (both of the United States), Hassia (Germany), and SIG (Switzerland) are among the firms planning new ventures in Japan.

The prospect of this liberalization has prompted the Japanese Government to urge reorganization of the industry and to back the establishment of a packaging equipment leasing company by domestic manufacturers. Although the reorganization has not

Table 1.—Japan: The market for food processing and packaging equipment, 1973, 1974, and 1978

(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	37.0	34.3	65
Bakery [1]	87.9	89.6	137
Beverages	60.4	57.2	86
Other sectors	349.7	322.9	480
Subtotal	535.0	504.0	768
Food packaging equipment			
Forming, filling, sealing	203.9	217.7	250
Wrapping, packing	60.0	60.3	80
Marking, inspecting	9.0	10.3	20
Container/product/package preparation and handling	5.7	6.0	10
Subtotal	278.6	294.3	360
Total food processing and packaging equipment	813.6	798.3	1,128

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[1] Figures include bread making machinery purchased by manufacturers in the grain milling sector and cake and cookie machinery purchased by manufacturers in the confectionery sector.

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Japanese trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Japan: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-1973

(in thousands of U.S. dollars)

	1971	1972	1973
Food processing equipment			
Ice cream freezers			
United States	304	985	703
Italy	293	281	423
Denmark	63	29	304
Taiwan	—	87	132
Others	5	—	18
Total	665	1,382	1,580
Dairy machinery other than ice cream freezers and cream separators			
United States	184	187	129
Sweden	89	79	284
Denmark	198	116	256
United Kingdom	29	86	171
Others	190	82	211
Total	690	550	1,051
Presses, crushers, and other machinery used in winemaking, cidermaking, fruit juice preparation, etc.			
United States	649	341	706
France	50	45	59
Switzerland	—	—	13
Italy	3	5	—
Total	702	391	778
Machinery for milling flour			
United States	2	10	—
Germany	246	367	1,257
Switzerland	126	304	257
Spain	—	2	—
Total	374	683	1,514
Other machinery for milling grain and working cereals and dried leguminous vegetables			
United States	106	51	21
Germany	363	403	995
Switzerland	174	279	286
United Kingdom	11	—	—
Others	1	34	5
Total	655	767	1,307
Other food processing machinery			
United States	1,639	1,537	3,352
Germany	1,459	2,101	4,040
Switzerland	317	992	941
Denmark	492	145	374
Others	1,304	2,171	1,718
Total	5,211	6,946	10,425
Packaging equipment[1]			
Machinery for aerating beverages and for cleaning or drying bottles or other containers			
United States	283	443	419
Germany	225	326	1,192
United Kingdom	21	54	119
Switzerland	16	38	76
Others	82	—	81
Total	627	861	1,887
Automatic wrapping machines			
United States	490	531	380
Germany	850	1,526	552
Switzerland	1,081	574	507
Italy	1,362	585	353
Others	704	464	95
Total	4,487	3,680	1,887
Other packing or wrapping machines			
United States	5,886	5,832	8,299
Germany	5,446	6,600	6,611
Sweden	3,018	2,103	3,613
Switzerland	456	1,413	823
Others	3,960	2,623	3,085
Total	18,766	18,571	22,431

[1] Since Japanese official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Japanese trade sources to account for 60% of total packaging equipment imports in 1971, 58% in 1972, and 55% in 1973.

Source: *Japan Exports and Imports,* Ministry of Finance.

yet taken place, 108 domestic producers have formed the Japan Packaging Lease Co. which commenced operations in 1974.

Some prominent firms making food processing equipment in Japan are the Hanaki Manufacturing Co. Ltd. and the Yamaguchi Iron Works Co. Ltd., producers of meat processing equipment; Gordon Johnson Japan Co. Ltd. (joint venture of Mitsui and Gordon Johnson-Stephens Ltd. of the United Kingdom), poultry processing machinery; Izumifood Machinery Co. Ltd., ice cream freezers; Nissei Sweden Freezer Seizo K.K. (joint venture of Nissei and Sweden Freezer Mfg. Co. of the United States), freezers; Yamato Sanko Manufacturing Co. Ltd., food drying apparatus; and Yaesu Shokki Manufacturing Co. Ltd., juice extractors and other beverage-making devices.

The leading manufacturers of bakery equipment

Table 3.—Japan: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1971*

Sector	Large	Medium	Small
Meat, poultry, and eggs	11	90	641
Dairy	3	156	1,494
Fruit and vegetable	—	151	2,397
Grain	—	33	1,489
Bakery	28	378	5,936
Sugar and confectionery	28	585	15,500
Fats and oils	4	28	474
Beverages	21	156	5,002
Fish and seafood	9	287	14,101
Miscellaneous food products	15	209	38,033

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[1] Large = 500 or more employees.
Medium = 100-499 employees.
Small = 99 or fewer employees.

Source: *Census of Manufacturers in 1971*, Ministry of International Trade and Industry (Japan).

include the Oshikiri Machine Works Co. Ltd. (licensee of AMF for bread cutting and autopacking equipment), Rheon Automatic Machinery Co. Ltd., and Fujisawa Manufacturing Co. Ltd. A joint venture, Nisshin-DCA Foods Inc., produces doughnut machines, and the Osa Machinery Co. Ltd. manufactures confectionery equipment.

Mitsubishi Heavy Industries Ltd., an enterprise of the Mitsubishi conglomerate, is a major manufacturer of packaging equipment in Japan. The firm holds licenses from Automatic Sprinkler, Bemis, Fogel Refrigerator Co., and George J. Meyer Manufacturing (all U.S. companies); from Canadian International Paper Corp.; and from Industrie-Werke Karlsruhe A.G. (Germany)

Other major producers include C. Itoh and Co. (licensee of Mecaplast S.A. of Switzerland), manufacturing plastic bottle forming, filling, and sealing machinery; Hayashida Machinery Industrial Co. Ltd. (licensee of Fords Finsbury of the United Kingdom), capping devices; Okura Machinery Co. Ltd. (an FMC licensee), capping units; and Shikkoku Kakoki Ltd. (licensee of Hamba Maschinenfabrik of Germany), milk bottling equipment. Daiwa Can, Toyo Can, and Sanwa are also important producers of packaging equipment.

Japanese manufacturers have offered lower prices than their American and European competitors, as well as advantageous financing, custom designs to meet users' specifications, short delivery times, and prompt parts supply and repairs. However, spiraling wages and other producer costs are rapidly driving prices up. The selling price of domestic food processing and packaging machinery rose by 30% during 1974, and an additional increase was planned for 1975.

Third-country competition.—Automated baking, large-scale milk processing, and continuous automatic food packaging equipment typify the kinds of machinery frequently imported by Japanese food processors. The United States and Germany are the principal sources of Japan's food processing and packaging equipment imports, and companies from both countries sell a wide variety of equipment in the market (see table 2).

Some leading German suppliers of food processing equipment to the Japanese market are Braunschweiger Maschinenbauanstalten (BMA), sugar processing machinery; Fr. Winkler K.G., bakery ovens; Werner & Pfleiderer, bakery apparatus; Hutt GmbH., confectionery devices; Kramer & Grebe, meat processing units; and Seitz, beverage processing equipment. German producers active in the Japanese market for food packaging equipment include Kronseder, Hesser Maschinenfabrik, Hassia Verpackung AG, Rovema Verpackungmaschinen, and Lubeca Maschinen und Anlagen. German equipment has a reputation for high performance and suitability to Japanese requirements for medium-capacity production and is supported by manufacturers' policies of reliable maintenance and technical services.

Imports from countries other than the United States and Germany tend to cluster in the specific equipment categories for which the manufacturers hold international reputations. For example, imports from Sweden consist mostly of advanced-technology devices for the dairy and seafood processing industries. The principal import from Switzerland is confectionery equipment, which is normally more compact and has a longer operational life than similar Japanese products. Italy is an important supplier of both confectionery and noodle-making equipment; Italian machinery is often priced as much as 20 to 30% lower than that made by domestic manufacturers.

Leading suppliers of food processing equipment from these three countries are Sweden's Alfa-Laval AB (dairy equipment) and Square Co. AB (square formers for food patties); Switzerland's Buhler Brothers Ltd. (confectionery equipment); and Italy's Pavan S.p.A. (spaghetti-making equipment) and Ruffinatti (confectionery equipment). Important suppliers from other European countries include Hoyer A/S of Denmark (ice cream machinery), Simon Freres of France (dairy processing equipment); the Dutch companies N.V. De Vuurslag (bakery units) and Simon-Heesen N.V. (confectionery equipment); and the British firms Baker Perkins Inc. and Simon-Vicars Ltd. (confectionery and baking equipment).

Foreign firms active in the Japanese market for food packaging equipment include Akerland & Rausing and Tetra Pak International AB (Sweden), SIG (Switzerland), Plastimechanique and Holweg (France), Fords Finsbury (United Kingdom), ACMA (Italy), Andersen and Bruun's Fabriker A/S (Denmark), and Canadian International Paper

Co. Ltd. and Wrap-O-Matic Machinery Co. Ltd. (Canada).

Imports of food processing and packaging equipment into Japan are usually handled by combination import/distribution trading companies, called shosha's. The shosha is an important intermediary, engaging in product promotion on behalf of the seller and assuming direct financial responsibility for import payment on behalf of the buyer. Because it is customary in Japan for distributors to cultivate and maintain close, personal relationships with client companies, the services of a shosha can be critical to sales effectiveness.

Smaller shosha's which specialize in industrial machinery frequently have a good capability for product promotion and do not require the large volumes of business frequently sought by the general trading companies.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find favorable opportunities for sales of the following types of equipment to the major sectors of the Japanese food processing industry.

Food Processing Equipment

Meat, poultry, and eggs.—Beaters (tenderizers), molding machines/presses, frozen meat flakers/slicers/cubers, boning machines, cooling/freezing units, and slaughtering equipment.

Bakery. — Doughmixing / kneading / dividing / rounding/proofing machines, pie and shaping machines, freezing equipment, biscuit/wafer/cracker machines, and continuous process ovens.

Beverages. — Germination machines, straining vats, rectifying plants, carbinating machinery, and concentration control equipment.

Food Packaging Equipment

Forming, filling, sealing.—Extrusion blow-molders, two-piece canmaking machinery, fillers for viscous products, heat sealers, cappers, crimpers, hooders, can closers and sealers, and vacuum and gas form/fill/seal systems.

Wrapping, packing.—Shrink-wrappers and tunnels, cartoners, and multipackers.

Marking, inspecting.—Labelers, coding equipment, check-weighers, can wrappers, imprinting/printing equipment, and seam testers.

Container/product/package preparation and handlingk—Unscramblers, palletizers, container cleaning/washing/drying systems, accumulators/collators, feeding/orienting equipment, and unloaders.

The research survey indicates that the following American-made products also are in strong demand in Japan: spray-driers, pasteurizers, and homogenizers for the dairy industry; hoppers, flake-making machines, and grinders for grain processing; and shaping, tabletting, and comminuting equipment for confectionery production. Also required by various sectors of the food processing industry are liquid nitrogen tunnel freezers, blast freezers, continuous quickfreezing (IQF) systems, aseptic systems for processing and bulk storage, continuous mixers, sterilizing systems, and accumulators.

Table 4.—Japan: Basic data on food processing industry sectors, 1973

Sector	Production ($ billions)	Capital expenditures ($ millions)
Meat, poultry, and eggs	1.34	78.8
Dairy	2.32	84.2
Fruit and vegetable	1.86	44.0
Grain	2.39	76.9
Bakery	1.05	56.4
Sugar and confectionery	4.21	124.5
Fats and oils	1.71	28.6
Beverages	8.41	349.1
Fish and seafood	3.10	149.5
Miscellaneous food products	2.68	190.5

Source: Data based on "Beverage and Food Statistical Report" and "Equipment Investment Report," *Japan Economic Journal*, Ministry of International Trade and Industry.

The Food Processing Industry

Japanese food processing enterprises reported total output of $29.1 billion and aggregate capital expenditures of $1.2 billion in 1973; the industry consists of approximately 87,000 companies, 97% of which are small firms employing fewer than 100 workers (see tables 3 and 4). Nearly 120 large firms (those with over 500 employees) are responsible for a sizable share of total production, and further concentration within the industry appears probable. Some of the country's leading conglomerates are acquiring control of major food processing and retailing firms and grouping these enterprises into food products manufacturing consortia. The ultimate objective of such groups is a vertical integration of processing and retailing operations using imported supplies. Japan is heavily dependent upon importation of foodstuffs from abroad, traditionally purchased by the major trading companies.

The five consortia presently operating in the food processing industry are the Mitsubishi group (financed by the Mitsubishi Bank), the Mitsui group (Mitsui Bank), Marubeni group (Fuji Bank), C. Itoh group (Daiichi Kangyo Bank), and the Sumitomo group (Sumitomo Bank). Mitsubishi controls four beverage companies (the Kirin Brewery Co. Ltd., Sanraku-Ocean Co. Ltd., Chukyo Coca-Cola Bottling Co., and the Fuji Coca-Cola Bottling Co. Ltd.), two meat and poultry processors (Ryoto

Broiler Co. Ltd. and Nippon Meat Packers Inc.), and a major baking company (Morinaga & Co. Ltd.). The Mitsui group's principal food processing enterprise is the Mikuni Coca-Cola Bottling Co. Ltd. The Marubeni Group consists of Sapporo Breweries Ltd., the Yamazaki Baking Co. Ltd., Shinshindo Baking Co. Ltd., Omiya Ham Co. Ltd., and Sumita Broiler Co. Ltd. The Itoh group controls a bakery, Meiji Seika Kaisha Ltd., and Prima Meat Packers Ltd. The fifth group, Sumitomo, consists of Asahi Breweries Ltd., Marudai Food Co. Ltd. (meat and poultry), and Toyo Jozo Co. Ltd. (beverages).

These firms and other enterprises have rapidly expanded production of prepared foods, especially frozen and convenience foods. Between 1968 and 1973, frozen food output increased from 77,100 metric tons (MT) to 317,800 MT, representing an average annual growth rate of 33% over the 5-year period. Frozen cooked foods (other than fried dishes) were the fastest growing type of frozen products, increasing from 5,000 MT in 1968 to more than 107,000 MT in 1973. In the latter year, the number of companies producing frozen foods had risen to roughly 500, compared with only 185 firms 5 years earlier; their total annual expenditures for quickfreezing equipment were estimated at $67 million in 1973.

Retort (cook in pouch) foods are becoming increasingly popular in Japan. The principal products currently marketed in retort pouches are prepared meat dishes such as stew, curry, and meat sauce for spaghetti. Some 20 firms prepare these foods.

Japanese food processors rely heavily on plastics for packaging, these constituting nearly 20% of total materials used. Applications include plastic film for casing ham and sausages by the heat-shrink method, laminated film for retort pouches, stretch film, and thermoform bags. Glass bottling still predominates in the beverage industry, but there is a growing trend toward the use of metal, particularly aluminum cans; canned beverage production increased from 6% of total output in 1971 to approximately 17% in 1974. Cardboard containers for milk and fruit juice also are gradually finding acceptance.

This consumption pattern of materials may be affected by recent increases in the price of petrochemicals and by the anticipated enactment of a "Law to Recycle Natural Resources Now Wasted by Industry." Packaging materials covered in the proposed legislation are plastics, aluminum cans, and wastepaper. The introduction of methods for the reuse of plastic packing is likely. Similarly, the high energy costs associated with the manufacture of glass containers will probably prompt an increased interest in bottle-cleaning systems and related equipment.

Japan's food processors generally incur raw material costs higher than world market levels because of a national agricultural price support program. Many types of processed foodstuffs are subject to import quota controls that afford domestic manufacturers protection from foreign competition. In addition, dairy processors receive differential payments to compensate for the price controls applicable to dairy products.

A review of the three sectors of Japan's food processing industry with the heaviest potential equipment demand follows. In each, the level of imported equipment is high, because of emerging requirements for automated and other advanced equipment not produced domestically. When selecting foreign-made machinery, purchasers in these sectors tend to prefer multipurpose over special-purpose equipment and compact over spreadout systems. They frequently compare competing items on the basis of performance, handling ease, maintenance service, and availability of spare parts.

Meat, poultry, and egg processing.—Japanese production of processed meats and poultry increased by 33% from 286,400 tons in 1971 to 381,700 tons in 1973. Total industry output (including eggs) in the latter year was valued at $1.34 billion. Although the sector comprises approximately 740 firms, the 11 largest have a very high share of total output, particularly in prepared meats processing. Capital expenditures by all firms totaled $78.8 million in 1973.

The country's three leading meatpackers are Nippon Meat Packers (Mitsubishi), Prima Meat Packers (Itoh), and Ito Ham Provisions Co. Ltd. Prima, the country's second ranking meatpacker, is 25% owned by Oscar Meyer, and it conducts processing and packaging operations under Oscar Meyer licenses. In 1972, these three firms turned out 155,300 tons of ham and sausages, approximately 60% of all such production.

In the canning of cooked meats and poultry, four firms accounted for 53% of output in 1972. These were Nozaki Co., Meidiya Co., MCC Co., and Santa (Kokusai Shokuhin).

A number of the meatpackers are planning additional plant capacity to accommodate the growing national demand for meat products, which is forecast by the Ministry of Agriculture and Forestry to expand by 6.7% annually through 1977. Among the new projects is a $6.5-million plant at Shin Tokushima, scheduled for completion in 1975 and designed to provide Nippon Ham with an additional capacity of 7,500 tons per year.

Nihon Nosan Kogyo anticipates expanding its Honmoku factory sometime after 1975, and Prima and Ito plan to construct new facilities after 1976. Another large processor, Hayashikane Sangyo (Hayashikane Food Industry Co. Ltd.) also expects to invest in a new plant prior to 1980.

Future investment for replacement and modernization will result from completion of a life cycle of the equipment purchased extensively during the 1972-1973 period of rapid expansion. In Japan, such equipment is customarily used for 3 to 4 years. Because improved productivity is a chief objective of replacement expenditures, and because Japanese packers rely heavily on foreign technology for this purpose, imports should constitute a large proportion of the new equipment purchases.

Processing techniques recently introduced in Japan include the addition of compound proteins to processed meats and the use of liquid nitrogen in quickfreezing. The industry is experimenting with a radiation method of pasteurization and with the development of packaging suitable to the process.

The new Tokyo factory of Prima Meat Packers Ltd. uses techniques typical of those employed in large, modern facilities. The factory, Prima's largest, produces ham, sausages, and fresh meats; its monthly production capacity is 1,999 tons of processed meats and 131 tons of fresh meats. Facilities include a 13,844-square meter refrigerated warehouse, 3 broiler units, 13 freezing units, 13 mixers, 17 fillers, and 11 automatic packers. Much of the production equipment was purchased from the United States and Germany, but the leading suppliers were two domestic firms—Hanaki Mfg. and Yamaguchi Iron Works.

Bakery products manufacturing.—Trends toward product improvement, greater product variety, and modernization of packaging and distribution techniques are expected to shape equipment demand and to support a high level of purchases by bakery facilities during the 1974-78 period. Large expansion in total output, however, is unlikely; the consumption of flour for breadmaking is projected to increase by only 2.6% annually in 1975 and 1976.

Past production data illustrate the sector's development. Total production increased slightly between 1970 and 1973, going from 1,007,400 tons to 1,015,000 tons. In that period, breadmaking dipped from 970,000 tons to 963,000 tons, but the production of baked goods such as cookies and cakes went up nearly 40%, increasing from 37,400 to 52,000 tons.

Total output was valued at $1.05 billion in 1973. The industry, comprising some 6,000 enterprises, invested $56.4 million in capital goods in that year.

Although most of the baking companies are small, major firms account for a sizable proportion of total production. According to the Japan Baking Industries Association, its 27 largest members baked nearly 40% of the bread produced in 1973. In the same year, the six leading manufacturers of biscuits and crackers reported 54% of total sales in that category. These firms are Morinaga & Co. Ltd., a member of the Mitsubishi group; Yamazaki-Nabisco (Yamazaki Baking Co. Ltd.), a member of the Marubeni group; Tohato Tokyo; Kita-Nippon Shokuhin; Meiji Seika Kaisha Ltd., a member of the Itoh group; and Ezaki Glico.

Beverage manufacturing.—Japan's beverage production increased at an average annual rate of 9.1% from 2.07 billion gallons (gal) in 1970 to 2.69 billion gal in 1973. The industry's output in the latter year consisted of 1 billion gal of beer, 797 million gal of carbonated beverages, 520 million gal of sake, 104 million gal of other alcohoic beverages, and 269 million gal of noncarbonated soft drinks. Production in most of these beverage categories during the 3-year period expanded at rates close to the industry average. The two exceptions were carbonated beverages, which grew at an average annual rate of 14.5% and sake, with an annual increase of only 2%. Total output by beverage manufacturers in 1973 was valued at $8.4 billion and total capital investment at $349 million.

Approximately 5,200 enterprises manufacture beverages in Japan, but a handful, principally those controlled by the conglomerates, virtually dominate production of beer, whiskey, and carbonated soft drinks. The country's four breweries and their 1972 shares of the beer market (based on volume of shipments) are: Kirin (Mitsubishi group), 60%; Sapporo (Marubeni), 21%; Asahi (Sumitomo), 14%; and Suntory Co., Ltd., 5%. Whiskey distilling is only slightly less concentrated, with Suntory accounting in 1972 for a 69% share of the market; Nikka Whiskey Co. Ltd., 23%; Sanraku-Ocean (Mitsubishi), 4%; and 34 other companies, 4%. In carbonated beverage production, Coca-Cola, Pepsi-Cola, and Morinaga dominate production; together they accounted for nearly 75% of total soft drink shipments in 1973.

Ezaki Glico, which is currently enlarging a factory at Takefu, anticipates a new $5-million investment after 1975; Morinaga plans to modernize its handling and distribution systems. The Fuji Flour Milling Co. Ltd. projects additional cake production capacity, and the Daiichiya Baking Co. Ltd. foresees conversion of a traditional plant to the production of frozen cakes.

The leading bakers are currently competing for larger market shares through the acquisition of "window bakeries" is urban areas. Such firms will require high-speed, high-productivity equipment to compensate for rising labor costs and low retail prices.

To augment the advanced processing methods already in use, the baking industry is interested in the introduction of new techniques. For example, research is being directed toward development of processes based on fermentation and the cultivation of microorganisms.

The procedures used at Daiichiya Baking Company's Kamamachi plant illustrate those of a large-scale, modern operation. Daiichiya is the country's second largest baker, and this plant is the firm's leading producer.

The Kamamachi factory bakes bread, cakes, and cookies. Its bread production system has 4 high-speed mixers for flour—each with capacity for 50 bags containing 25 kilograms (kg), 2 flour-sending units, 2 dividers, 2 rounders, 2 proofers, 2 forming machines, 2 tunnel ovens, 1 bread cooler, and 4 automatic packing machines. The plant was constructed in 1968 with most of its equipment supplied by the Fujisawa Manufacturing Co.

The Kirin, Sapporo, and Asahi breweries have budgeted construction funds for 1975. Kirin plans a 100,000-kiloliter (kl) per year brewery at Tochigi and a 2.4 million case per year soft drink plant at Fukuoka. Sapporo anticipates installing a 500 barrel per day (bpd) line in its Ebisu barreling plant, a 50 kl per hour beer filtering line in a Nagoya plant, and a 33,000 can per hour line for soft drink production at Atsugi. Asahi expects to invest $33 million in a 60,000 kl per year plant at Fukoshima. Sapporo also plans a new brewery at Yaizu after 1976, and Toyo Jozo intends to open a new sake plant before 1980.

Automation is standard in the large plants. Most also use modern cleaning processes such as the Clean-In-Place (CIP) System.

Another type of advanced equipment used is an automatic checker, developed by Mitsubishi Heavy Industries Inc. This checker, installed in 20 factories, can inspect clear and tinted bottles internally and externally at a capacity of 36,000 bottles per hour.

The Toride Brewery of the Kirin Brewery Co. Ltd., completed in 1973, is a large, modern beverage plant producing both soft drinks and beer. The brewing capacity is 266,000 kl per year. The plant is equipped with two brewing systems—each producing 26,400 gal of malt 7 times daily, 98 fermentation tubs with an aggregate capacity of 2.8 million gal, and 634 storing tubs with a total capacity of 8.6 million gal. There are also seven bottling lines (four handing 32,100 bottles per hour each, two handling 47,280 bottles per hour each, and one line handling 60,000 bottles per hour), 4 boiler units (2 sets for 28 tons per hour each and 2 sets for 38 tons per hour each), and 9 refrigerating units—the largest of which has an hourly capacity of 5.6 million BTU. The facility also has two fully automated warehouses. The major equipment supplier is Mitsubishi Heavy Industries Ltd.

Trade and Technical Regulations

The Japanese tariff rate on imports of most categories of food processing and packaging equipment is 6% ad valorem. Detailed information on the duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

Electric current used in Japan is generally 100/200 volts, single and 3-phase. High voltage distribution lines are 3,000 or 6,000 volts. Such lines are fed directly to plants and buildings; higher voltages are also available. The frequency varies according to the geographic area; it is 50 hertz in northern Japan, including Tokyo, and 60 hertz in the remainder of the country. Use of the metric system of weights and measures is mandatory in Japan.

No specific technical standards apply to food processing and packaging equipment. General standards are developed by the Japan Industrial Standards Committee and published by the Japanese Standards Association, located at 1-24 Akasaka 4-chome, Minato-ku, Tokyo 107, Japan.

Information on the availability of published Japanese standards may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This survey is one of a series based on market research reports prepared overesas for the Office of International Marketing. Current and detailed marketing information on Japan to supplement this report is available on a continuing basis from:

Country Marketing Manager—Japan
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-2427

A loan of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in Japan," DIB 74-12-533, October 1974.

The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food Processing and Packaging Equipment—Japan" which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

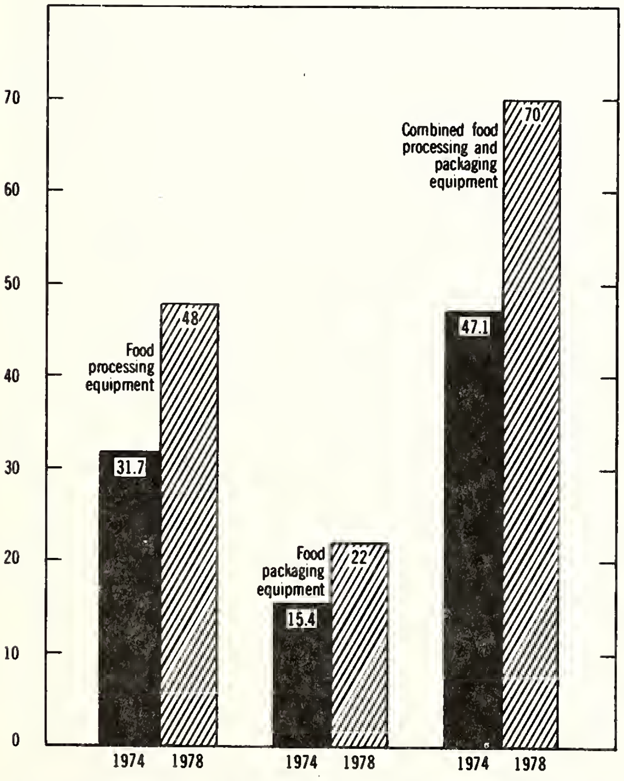
Mexico

Mexico's food industry is expected to spend $70 million [1] for processing and packaging equipment in 1978, which will represent an average increase of 10.5% annually from the 1974 outlays of $47 million (see table 1). This projection is based on the changing food consumption patterns of Mexico's rapidly growing and increasingly urban population.

Sales of *food processing equipment,* which grew from $27 million in 1972 to nearly $32 million in 1974, are projected to rise by a yearly average of 11%—reaching $48 million in 1978. Imports of this equipment may reach $24 million in that year, up from $15.6 million in 1974 and $13.6 million in 1972.

Mexico: Food processing and packaging equipment market, 1974 and 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Mexican trade source estimates and projections of equipment purchases ultimately made by domestic end users.

The United States is by far the most important foreign source of supply, having accounted for 58%—$9 million—of Mexico's food processing equipment imports in 1974. Market analysts suggest that American exporters are capable of boosting their share of these imports to 75% by 1978. Geographical proximity and the substantial participation in Mexico's food processing industry by subsidiaries and licensees of U.S.-owned corporations support the U.S. position.

The Mexican market for *food packaging equipment* should expand by approximately 9% per year during 1974-78, reaching an annual level of $22 million at the end of the period. Sales rose from $11 million in 1972 to $15.4 million in 1974. Imports, which increased from $9.5 million in 1972 to $13.6 million in 1974, are expected to exceed $19 million in 1978.

American equipment represented $8.4 million, or 62%, of Mexico's food packaging equipment imports in 1974; vigorous promotional efforts could win the United States an 80% share of the market in 1978.

Competitive Environment

Mexico's food industry purchases approximately 50% of its processing equipment from foreign sources. Little change is expected to occur in this proportion, since domestic manufacturers will be

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[1] All values are shown in U.S. dollars. Local currency data for all years are converted at the exchange rate of US$1 = 12.5 pesos.

Mexico—Economic Indicators
(1973)

Gross domestic product:	**$49.5 billion**
Total country imports:	**$ 4.1 billion**
Imports from U.S.:	**$ 2.6 billion**
Total country exports:	**$ 2.2 billion**
Exports to U.S.:	**$ 1.5 billion**
Population:	**56 million**

hard-pressed merely to maintain their share of this rapidly growing market during the next few years. Imports will continue to account for nearly 90% of the market for food packaging equipment, despite some competition from local producers of low-capacity packaging machinery.

Since many of Mexico's most important food processors are subsidiaries or affiliates of foreign (especially American) companies, decisions on procuring equipment often are made by corporate purchasing officers in the United States and Europe. The Mexican enterprise customarily buys the machinery recommended by its parent or licensor. This practice is one reasons for the high volume of U.S.-made equipment that is imported into Mexico.

European equipment often is selected for the production of foods that are typically European, such as olive oil, tomato concentrate, and certain confections. Sometimes, too, equipment with lower capacity or less sophistication than most U.S.-made processing or packaging machinery is considered more suitable for local needs.

While Japanese machinery occassionally has been chosen because of its low price, some purchasers have selected higher priced U.S. products because of their reputation for greater durability.

The technical and financial assistance afforded by European sellers of food processing and packaging equipment, while reportedly superior to that offered by American manufacturers, does not at present appear to be a prime factor in influencing purchasing decisions.

A description of U.S. industry's competition from local as well as third-country manufacturers actively selling processing and packaging machinery to Mexico's food industry is presented in the paragraphs below.

Food processing equipment.—German manufacturers rank second to U.S. producers in supplying Mexico with food processing equipment. Although the German share of the import market has varied substantially from year to year, ranging from 7% to 30% during 1971–73, German-made machinery is used in virtually every sector of Mexico's food processing industry (see table 2). Purchases from Germany in recent years have included malt-processing, bakery, and sausage-making equipment; various kinds of filters and filter presses; and chocolate and confectionery kneading machines.

A wide variety of food processing equipment also is imported from the United Kingdom. Specific items include extractors for sugarcane juice, grain and seed graders, and bakery and confectionery machinery. The British share of the import market ranged from 1% to 6% in 1971–73.

Manufacturers from several other foreign countries are active in the Mexican market for food processing devices. Italian vendors, for example, provide much of the equipment required by Mexico's thriving tomato processing industry. Other imports from Italy include machinery for making pasta and beverages as well as for kneading chocolate and molding butter.

Spanish manufacturers make units for Mexican processors of olive oil, certain beverages, and vegetables. Suppliers from the Netherlands sell machinery to the sugar and confectionery sector. Brazilian and Argentine merchants, taking advantage of the preferential tariff treatment afforded members of the Latin American Free Trade Association (LAFTA), have entered the Mexican market with grain and seed graders and classifiers, potato peelers, and olive oil processing machinery. Japanese firms provide modest quantities of candymaking equipment.

German companies whose food processing equipment is used in Mexico include Miag Muhlenbau und Industrie GmbH, Dubler, and Seeger (all producers of malt mills), Hambach & Zelle (enrobing, pulling, kneading, casting, and cooling equipment

Table 1.—Mexico: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Fruit and vegetable	2.6	2.8	4
Grain	8.9	9.9	15
Sugar and confectionery	3.4	3.8	6
Fats and oils	5.7	6.3	10
Beverages	2.1	2.4	4
Other sectors	5.9	6.5	9
Subtotal	28.6	31.7	48
Food packaging equipment			
Forming, filling, sealing	2.1	2.3	3
Wrapping, packing	7.0	7.7	11
Marking, inspecting	1.4	1.5	2
Container/product/package preparation and handling	3.5	3.9	6
Subtotal	14.0	15.4	22
Total food processing and packaging equipment	42.6	47.1	70

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Mexican trade source estimates and projections of equipment purchases ultimately made by domestic end users.

for candy manufacture), Koruma (pulp mills for tomato processing), and Westfalia Separator AG (liquid centrifuges and centrifugal filters).

Other European firms selling food processing equipment to Mexico include Simon Engineering Co. Ltd. (vacuum separators for grain mills) and A. W. Smith (sugar mills) of the United Kingdom; Manzini (tomato concentrating machinery), Padovan (beverage pasteurizers and heat exchangers), Rossi Catelli (tomato paste equipment), and Titano (continuous vaporizers for tomato concentrate) of Italy; Talleres Saez (fruit processing machinery), Chico (black olive mills), and Saldri (olive destoners) of Spain; and Jenny Pressen (cider presses) of Switzerland. Carballo, an Argentine manufacturer, sells beverage carbonation machinery in Mexico.

The domestic food processing equipment industry comprises approximately 50 companies, of which perhaps 20 also make food packaging apparatus. However, those manufacturing on a large scale, including licensees of foreign corporations, number no more than 15 to 20. Wholly Mexican-owned companies are estimated to account for 30% to 40% of domestic output of both processing and packaging equipment.

Domestic manufacturers provide approximately 50% of the food processing machinery purchased by Mexican end-users. Much of the Mexican-made goods consists of tanks, tubing, motors, compressors, and other components to be used with imported equipment. The few companies that make more complete systems do so either under licenses or by adapting foreign designs to their own use. Most grain milling equipment can be purchased from local producers, as also can the relatively simple presses and other machinery used to process and refine fats and oils. Cocoa-bean processing equipment, chocolate-paste-milling machinery, and pasta-making equipment also are made in Mexico. It is common practice for food processors to manufacture simple devices in-house or to subcontract with small workshops.

The future growth of Mexico's food processing equipment industry depends on the needs of the domestic consumers, since it seems unlikely that export sales will grow to major proportions. Very little effort has been made to design apparatus with unique capabilities or special features that would attract foreign buyers, and rising production costs make it doubtful, anyway, that Mexican machinery would be sufficiently competitive in terms of price.

Some of Mexico's leading producers of items for food processing include Sanesa (a manufacturer of beverage carbonation units), Equipos Nacionales de Proceso (refrigeration compressors), Wallace & Tiernan (soft drink dosifiers), Remo S.A. (grain milling equipment), and Poli-Ingenieros S.A. (components such as pumps, washers, peelers, blanchers, and grinders). Buhler-Miag S.A. de C.V, a subsidiary of the Swiss-German company, manufactures grain mills, cocoa and chocolate processing devices, in-plant transportation systems, and pasta-making machinery.

Mexico protects all its industries by high tariffs and by import controls. Many types of food processing and packaging equipment therefore are subject to import licensing requirements. In principle, licenses are not granted for import of goods identical to those produced in Mexico or for which Mexican-made items can be substituted. This policy has been tempered in practice by considerations of actual availability and price. Committees representing both government and private interests examine each license application to determine whether or not satisfactory local equivalents exist. These reviewers are required to consider whether local manufacturers actually can deliver machinery with comparable capabilities within a reasonable period of time at a cost not more than 50% above the world price. Moreover, specific types of equipment that usually would be denied entrance into Mexico are regularly admitted as parts of complete processing systems. It is recognized that locally made components, designed as they are for a wide variety of applications, cannot always be adapted for use with complex imported systems.

Food packaging equipment.—German manufacturers have been successful in selling a wide variety of packaging machinery to Mexican industry. During 1971–73, Germany's share of the food packaging equipment import market ranged from 11% to over 15%. Some of the goods sold included automatic machinery for packaging grains; units for sacking and measuring solids; labelers; packaging and labeling systems; miscellaneous apparatus for filling, wrapping, or enclosing containers; and sealers for capsules or other containers.

Swiss producers accounted for 2% to 5.5% of Mexican food packaging equipment imports during 1971–73, and British firms held shares of 1.5% to 2.5%.

Major German companies selling equipment to Mexico include Hesser Maschinenfabrik (envelope forming, filling, and sealing machines for dry soups), Krones (labelers), and Schmallback-Lubeca Werk (can sealers and autoclaves). Other foreign suppliers include Italy's Padovan (beverage labelers) and Canada's Phinn (high-speed and other types of bottle labelers and strip stampers).

The approximately 45 domestic manufacturers of food packaging equipment—half of whom also make food processing equipment—supply roughly 10% of the country's market for such machinery. Seven companies account for 60% of these sales. Local producers are making a concentrated effort to provide

Table 2.—Mexico: Imports of selected categories of food processing and packaging equipment by country of origin, 1971–73

(in thousands of U.S. dollars)

	1971	1972	1973
Food Processing Equipment:			
Wine-making equipment			
United States	236	175	156
France	4	47	55
Italy	14	1	9
Others	2	27	3
Total	256	250	223
Kneading machines for bakeries			
United States	322	175	325
Germany	156	199	86
United Kingdom	35	45	47
Others	234	317	252
Total	747	736	710
Molding or dividing machines for bakeries			
United States	90	165	118
Germany	49	30	52
United Kingdom	8	11	19
Others	118	272	195
Total	265	478	384
Filling or icing machines for bakeries			
United States	76	64	184
Germany	40	—	43
United Kingdom	40	—	21
Others	—	37	27
Total	156	101	275
Slicers, choppers or sausage-making equipment for meat or fish			
United States	220	204	429
Germany	27	51	48
France	—	11	7
Others	258	234	367
Total	505	500	851
Fruit corers or peelers			
United States	62	48	116
Spain	43	21	20
Others	5	5	47
Total	110	74	183

	1971	1972	1973
Brewery equipment			
United States	89	73	3
Germany	21	—	614
United Kingdom	—	—	12
Others	19	11	5
Total	129	84	634
Food Packaging Equipment:			
Machinery for packaging or wrapping milk and other dairy products			
United States	351	496	884
Sweden	—	392	237
Germany	44	132	—
Others	599	134	97
Total	994	1,154	1,218
Machinery for filling containers with fruit, juices, or vegetables			
United States	27	133	188
Switzerland	—	—	79
Others	37	—	—
Total	64	133	267
Corking machinery			
United States	634	338	567
Germany	18	64	72
Others	147	191	181
Total	799	593	820
Automatic liquid filling-and-packing machinery [1]			
United States	829	773	964
Germany	13	38	—
Others	99	135	7
Total	941	946	971

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[1] Since Mexico's official trade statistics do not differentiate between packaging equipment for food and non-food uses in this equipment category, both types of equipment are included in these figures.

Source: Mexican Department of Industry and Commerce and Mexican Foreign Trade Institute.

most of the packaging equipment needed by the smaller end-users. However, as in the case of food processing equipment, much of their output consists of components and accessories to be used with imported machinery. Production of complete systems is still insignificant. Two of the best known firms are Envaflex (which produces baggers and other packaging equipment) and Zapata Hermanos (can sealers).

Mexico does not export food packaging equipment and is not likely to do so in the coming years. Imports of such goods are regulated by the same policies as those described in the discussion of food processing equipment.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find highly favorable opportunities for sales of the following types of equipment to the Mexican food processing industry:

Food Processing Equipment

Beverages.—Centrifugal clarifiers; press, plate vertical, and diatomaceous filters; carbonating machinery; concentration control equipment (dosifiers); and pasteurizers.

Sugar and confectionery.—Centrifuges, complete sugar-milling systems, vacuum filters, crystallizing apparatus, lollipop and hard-candy-making lines, and pulverizers.

Grain.—Ash ovens, coffee roasters and extractors, centrifuges, dry-spray towers, and granulizers.

Fats and oils.—Prepressing mills, neutralizers, deodorizers, magnetic separators, screeners, husking machines, heat exchangers, and continuous mixers.

Fruit and vegetable.—Autoclaves, colloidal mills, dehydrating machinery, abrasive and chemical peelers, pulpers, blanchers, corers, separators, destoners, pickling equipment, pasteurizers, continuous sterilizers, and heat exchangers.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquid, dry, viscous, and solid products; threaded and other types of bottle cappers; can closers; heat and other sealers; and gluing equipment.

Wrapping, packing.—Baggers for sugar and confectionery products; and cartoners.

Marking, inspecting.—Labelers, coding equipment, check-weighers, strip stampers, and seam testers.

Container/product/package preparation and handling.—Bottle washers, bottle sterilizers, bottle unloaders, and container vibrators.

The Food Processing Industry

Food processing, Mexico's largest single industry, in 1970 employed a total of 356,400 workers at more than 64,250 establishments; however, only 1,607 companies operated on a scale that can be termed industrial. Of those, 416 had value-added production in excess of $1.6 million each while 1,191 had value-added output in the $120,000 to $1.6 million range (see table 3). Some 62,600 smaller businesses produced food for direct sale or for distribution within a very limited geographical area. Total value-added production of processed food in 1970 was placed at almost $1.2 billion.

As is true of other Mexican industrial firms, food processors are having to contend with sharply rising production costs, due particularly to soaring wages and unexpected shortages of industrial and agricultural raw materials. Moreover, price controls instituted by the Government to help stem inflation have limited the food industry's ability to pass these rising costs to the consumer. Consequently, leading companies are finding traditional, labor-intensive production techniques to be less profitable and are having to consider adoption of more automated methods. Many of the smaller firms probably will be forced to merge with others or go out of business.

Most companies will be able to streamline their processing and packaging operations without building new plants or expanding existing facilities. The majority of Mexico's food processing plants are operating well below capacity, having been built fairly recently and on a scale that allowed ample margin for growth. Unfortunately, because 1973 and 1974 were unusually poor crop years for Mexico's farmers, processors have found that many raw agricultural products are now (1975) in short supply.

Table 3.—Mexico: Numbers of enterprises in food processing industry sectors by size [1] of enterprise, 1970

Sector	Large	Medium	Small
Meat, poultry, and eggs	28	91	1,160
Dairy	53	152	378
Fruit and vegetable	7	25	648
Grain	89	219	20,847
Bakery	20	218	16,760
Sugar and confectionery	60	87	2,644
Fats and oils	9	32	71
Beverages	108	255	1,688
Fish and seafood	33	63	26
Miscellaneous food products	9	49	18,424

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[1] Size of enterprise is based on value-added production, as follows:
Large = over $1.6 million
Medium = $120,000 to $1.6 million
Small = less than $120,000
Source: *Industrial Census 1970*, Mexico City.

Mexican consumer interest in packaged foods is just starting a period of major growth. The food industry is gearing up to meet this demand by shifting from traditional glass or paper containers and wrappers to the types of plastic packing already commonplace in the United States and elsewhere. Plans for the changeover appear to have been set back only temporarily by the recent sharp rise in the prices of plastics and other petroleum derivatives. Plastic bags are widely used for dry products such as rice, and plastic wrap is beginning to appear on cheeses and specialty foods. Margarine is ordinarily packaged in plastic tubs.

Mexican production of frozen food is relatively insignificant. However, at least one processor of foods for export has expressed interest in quick-freezing strawberries and pineapple chunks for shipment abroad.

The following paragraphs contain reviews of the five major sectors of the Mexican food processing industry. The sectors were ranked on the basis of their assets as reported in the 1970 Industrial Census.

Beverage manufacturing.—This industry has long been the most important in terms of the value of both its output and its capital investment. The 1970 census placed the total output of the industry's 2,051 firms at $945 million (see table 4), more than 75% above the level reported in the 1965 census. Over 100 companies had value-added production of at least $1.6 million each in 1970. The industry's fixed assets and working capital were valued at $731 million; employment approached the 68,000 level.

Table 4.—Mexico: Basic data on food processing industry sectors, 1970

(in millions of U.S. dollars)

Sector	Value-added production	Gross production	Assets [1]
Meat, poultry, and eggs	54	239	70
Dairy	76	322	105
Fruit and vegetable	64	175	120
Grain	128	495	255
Bakery	117	317	106
Sugar and confectionery	149	401	543
Fats and oils	84	432	201
Beverages	389	945	731
Fish and seafood	33	101	73
Miscellaneous food products	88	247	117

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[1] Total fixed assets and working capital.
Source: *Industrial Census 1970*, Mexico City.

Beer and soft drinks account for nearly 75% of total beverage sales. A record 1.5 billion liters of beer were produced in 1972. Production of soft drinks and bottled water in that same year was estimated at 3.8 billion liters. Output of alcoholic beverages other than beer was placed at 17 million liters in 1972, with a fermented drink called *pulque* (made from the juice of the agave plant) the principal product. Production of soft drinks and of distilled alcoholic beverages is expected to rise by 10% a year during the next few years; beer output should rise by 6% to 7%.

More of Mexico's larger food processing companies (those with yearly value-added production of at least $1.6 million) are to be found in the beverage manufacturing sector than in any other part of the food industry. The list of leading firms includes a number of internationally known corporations such as Coca-Cola, Pepsi-Cola, Seagram's, Bacardi, and Pedro Domecq. Beer production, however, is dominated by three wholly Mexican-owned firms—Cerveceria Modelo, Cerveceria Cuauhtemoc, and Cerveceria Moctezuma.

Canned beer and soft drinks are not widely available in Mexico. Nearly all beverages are sold in throaway or returnable glass bottles filled by U.S.-made bottling equipment. Processing equipment is obtained from various sources. Breweries buy German or other European equipment for malt processing. The several small companies that make carbonated cider typically use German or Italian machinery, and the hundreds of small producers of *pulque* use simple equipment of domestic manufacture. The big producers and bottlers use equipment that is fairly standard throughout the world .

The process employed at Sidrera Palazo, one of Mexico's largest cider plants, is exceptional and calls for use of specialized equipment. This factory is equipped to make up to 12 million liters of cider per year. Apples are juiced by two Swiss-made Jenny presses (similar to S-presses) of 15- to 20-ton capacity. Agencia Enologica Italiana (AEI of Italy) plate-type diatomaceous filters and Westfalia (German) centrifugal filters, all with capacities of 4,000 liters per hour, are used to filter the cider before and after aging. The cider is heated in a 4,000 liter per hour Padovan pasteurizer and cooled by a Padovan heat exchanger and a smaller Enofrigo cooler from Italy. Italian-made saturation columns with a 2,000 liter per hour capacity are used to carbonate the cider. Bottles, filled pneumatically, are corked; the corks are then wired on by an AEI wirer and the bottles labeled by Padovan equipment. The cases are loaded by hand for closing with a Bostitch pneumatic stapler. Sidrera Palazo is interested in purchasing a continuous apple-processing system and higher capacity saturation columns.

Sugar refining and confectionery manufacturing. The sugar and confectionery sector ranked second in the food processing industry in terms of assets and fourth in terms of production, according to the 1970 census. Refined sugar accounted for almost 75% of total output, which in 1970 was valued at just over $400 million, compared with $325 million in 1965. The 1970 figures exclude approximately $40 million worth of unbranded candies made at the artisan level. The sector's 2,791 establishments employed more than 57,500 people and had capital assets valued at $543 million in 1970.

Mexico's 64 sugar refineries produced 2.7 million metric tons (MT) of sugar during the 1973–74 crop year. Output has risen by 4.6% per year since 1968–69. The shift to factory-made confectionery and bakery products as well as the general rise in canned and processed food consumption boosted industrial use of sugar by an average 7.3% annually during 1968–72.

Cocoa powder and chocolate products account for approximately 45% of Mexican output of confectionery products. Chewing gum represents 35% of production, and miscellaneous industrially made candies, 20%. Subsidiaries or licensees of large foreign companies—specifically Richardson Merrell, The Quaker Oats Co., Nestle, and Anderson Clayton & Co.—account for roughtly 60% of sales. Other foreign firms represented in the industry include Warner Lambert Co., Adams, General Foods, Tootsie Corp., Canel, and Beech-Nut.

More than 80% of the imported equipment used in Mexico's sugar refineries is American-made. Typical installations include centrifuges from Roberts-Western States Machine Co., mills (including cane defibrators) from Fulton Iron Works Co., and vacuum filters from Dorr-Oliver Inc., all U.S. firms. A British firm, A. W. Smith, has also sold sugar mills to Mexican companies. Boilers and simple crystallizing apparatus are made in Mexico. Steam turbines are purchased from several different foreign sources.

At present, only a few mills package sugar in bags smaller than 50 kilograms (kg); however, several companies are interested in buying equipment to handle 500-gram, 1-kg, and 2-kg bags.

Mexican manufacturers of confectionery products find that European processing machinery best suits their scale of operations and their products. In many cases, however, American machinery is used to package the products. Industrias San Jorge S.A., a Mexican company whose turnover places it in the medium-size category (i.e., with value-added production from $120,000 to $1.6 million annually), makes 10 tons of hard candy per week. The ingredients are melted and cooked in a German-made vacuum cooker. Hambach & Zelle (German) equipment is used to roll, pull, or knead, diecast, and cool as much as 1.5 MT of candy hourly. The candies are wrapped on machinery made by Rose Forgrove Ltd. of the United Kingdom and bagged in plastic at the rate of 90 bags per minute on U.S.-made apparatus.

Grain milling.—This industry, which includes coffee roasting and processing as well as wheat, corn, rice, and other grain milling, had gross production of $495 million and assets of $255 million in 1970. The inclusion of more than 20,000 local corn mills which produce the *nixtamal* used in making tortillas raises the total number of establishments recorded in the 1970 census to more than 21,000. Except for the instant coffee factories, capital investment in this sector is rather low. Fixed assets and working capital average less than $500,000 per plant in most subsectors but increase to $800,00 for flour mills.

Flour mills such as Molino Las Flores, Harinera Nacional, Harinera Barquin, and Harinera de Tlalnepantla rank among the largest companies in the sector. The two largest instant coffee manufacturers, which together account for nearly all of the 7,300 tons produced in 1973, are owned by General Foods and Nestle. Leading corn flour millers include Kellog de Mexico, Molinos Azteca, and the Government-owned Maix Industrializada S.A. (Minsa).

The equipment in use at Molino Las Flores is of domestic, American, Swiss, and British manufacture. The grain is precleaned by a Simon Engineering Ltd. (United Kingdom) vacuum separator with capacity of 25 tons per hour. Buhler-Miag (Swiss-German) measuring equipment removes it from the silos. Bulk polishing and cleaning is accomplished by a Simon separator, Simon destoner (capacity 10 tons per hour), and a Carter (United States) disc separator. The grain is milled by Buhler-Miag (capacity 75 tons per day) and American-made (capacity 90 tons per day) equipment. Remo S.A., a Mexican firm, furnished the equipment used for washing the grain with water, the bagging machines, and the pneumatic components used with the imported milling equipment. The dust separation machinery and the settling bin were manufactured in-house.

One of the instant coffee plants owned by General Foods de Mexico S.A. has an annual production capacity of approximately 900 tons. Most of its equipment is American-made and includes Jade-Burns roasters and granulizers, Peneo extractors (4 tons per day), Bowen dryers, an FMC bottle cleaner and conveyor, a Beacon-Flow pneumatic scale filler, an F. Goodman sealer, and a New Way Packaging Machinery Inc. labeler (30 to 120 labels per minute). The only other imported processing equipment in this plant is an 800 gallon per hour Westfalia Separator AG (German) centrifuge.

Fats and oils processing.—Mexico's fats and oils processing industry grew rapidly during the 1960's to include 112 establishments with combined assets of more than $200 million and gross production of $432 million in 1970. During the past few years, however, oilseed shortages have left most processors with excess capacity.

More than 661,000 MT of fats and oils were produced in the 1972–73 crop year, compared with 608,000 MT in 1969–70. The principal products, with 1972–73 production figures shown in parentheses, include margarine and vegetable shortening (156,000 MT), lard (110,000 MT), cottonseed oil (91,000 MT), coconut oil (87,000 MT), and peanut, corn, and rapeseed oils (90,000 MT).

The Mexican subsidiary of the U.S.-based Anderson Clayton and Co. is the country's principal manufacturer of commercial fats and margarine. Five wholly Mexican-owned firms—Industria Aceitera, Industrias Gonzalez, Aceite Casa, La Polar, and La Palma—account for most of the refined vegetable oil output.

Much of the relatively simple equipment used in the processing of fats and oils is manufactured in Mexico. American firms are said to supply 70% of the imported equipment. Aceite Casa, for example, uses an Anderson IBEC super dual expeller, a Sharples neutralizer, and a Wurster & Sanger deodorizer—all imported from the United States—but manufactures its own open blanching and hibernation machinery. A Niagara bottle washer and a Bilner Ellison bottle filler, both American-made, are used in packaging the oils.

Fruit and vegetable processing.—Fruits and vegetables are processed at 680 establishments in Mexico. These factories employed 23,600 workers and had $120 million in assets in 1970, when gross production totaled $175 million. The sector's chief products, with 1973 output figures in parentheses, include chilis (78,000 MT), canned pineapple (38,200 MT), fruit juices (34,600 MT), tomatoes (26,500 MT), fruit preserves (11,500 MT), canned peas (6,400 MT), and strawberries (2,000 MT canned, 1,100 MT frozen).

Among the leading fruit and vegetable processors are the U.S. subsidiaries, Clemente Jacques (United Brands) and Del Monte, and three domestically-owned firms, Elias Pando S.A. de C.V., Empacadora Los Reyes, and Del Centro.

With nine plants in operation in 1973, Elias Pando had a sales volume of $40 million. The firm's plant in Sinaloa has a tomato processing line that can turn out 250 MT per three-shift day. It is equipped with 9 ton per hour Manzini (Italy) concentration machinery, a Titano (Italy) SRG continuous vaporizer, a Mexican-made atmospheric vaporizer, and Wankesha (United States) pumps. Sealers and crimpers include two U.S.-made Canco 006 and one Canco 400 as well as other imported apparatus. Equipment made by the American companies Pfaudler, King Fillers, and Food Machinery Corp. is used to fill containers which are then cooled by O'Donner and Chisholm-Ryder heat exchangers and labeled by U.S.-made New Way and Standard-Knapp products at speeds of 170 labels per minute.

Elias Pando's apricot canning facility at Aguascalientes uses primarily Spanish and Mexican equipment. It also utilizes a Chisholm-Ryder exchanger and New Way labelers.

Trade and Technical Regulations

Mexico's import tariff system is complex. The rate structure is composed of a specific duty based on weight or quantity, plus an ad valorem duty. The latter is assessed on either the invoice value or an "official valuation," whichever is higher. Mexico grants preferential customs treatment to imports from other LAFTA member nations.

Food processing and packaging equipment which is adjudged to be in direct competition with that manufactured in Mexico is subject to import licensing and very high duties. The complexity of the rate structure, however, makes it impractical to cite a range of such duties in this survey. Specific information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

The characteristics of the electrical power supply in the Mexico City area are 125/316 volts, 50 hertz. In most other parts of the country, 60 hertz current is used; voltage varies. The conversion of Mexico City's system from 50 to 60 hertz is now underway and should be completed by 1977.

Information on the availability of published standards for food processing and food packaging equipment in Mexico may be obtained through the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Mexico to supplement this report is available on a continuing basis from:

Country Marketing Manager—Mexico
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-5020

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

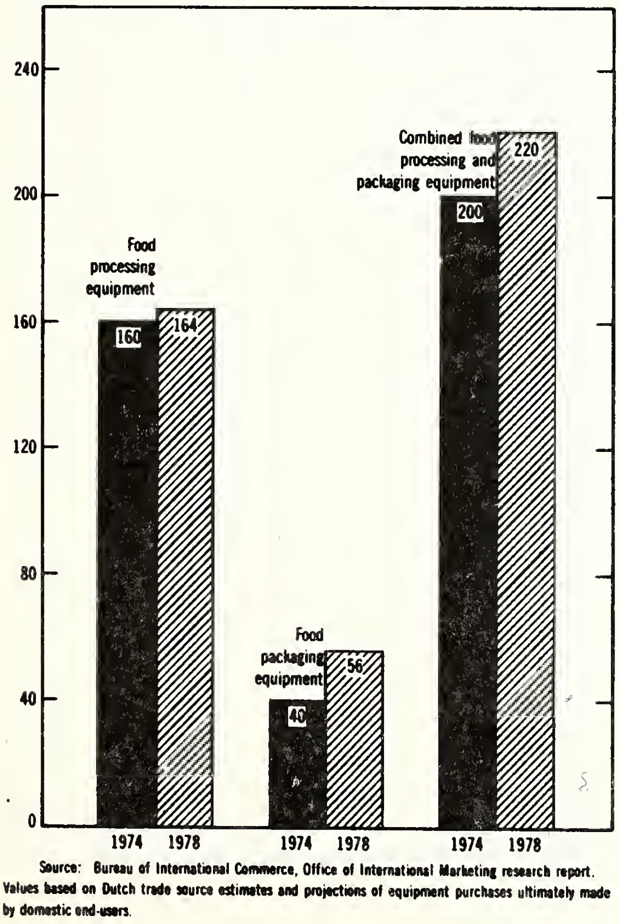
Please request: "The Market for Food Processing and Packaging Equipment in Mexico", DIB-74-11-520, August 1974.

The Netherlands

The Netherlands traditionally has been a major supplier of processed foods to world markets. A high degree of industrial efficiency enables the Dutch to process both imported raw foods and the products of their own thriving agricultural sector for export. Hence the country's market for food processing and packaging equipment is substantial. Expenditures for such machinery totaled $200 million [1] in 1974, up by an average 15.5% per year from the 1972 level of $150 million.

The Netherlands: Food processing and Packaging equipment market, 1974, 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Dutch trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

The outlook for sales of food processing and packaging equipment through 1978, however, is uncertain. Businessmen in Holland's food industry, concerned about the possible effects of current world economic difficulties on the future course of their export sales, are deferring major investments in new equipment. Moreover, most firms are still adjusting to the recent sharp rises in the costs of energy and raw materials. Market analysts place 1978 food processing and packaging equipment outlays at $220 million (see table 1), a figure that could prove to be conservative if there is a resurgence of business confidence in the meantime.

The Netherlands' market for *food processing equipment* expanded by a yearly average of 15%—from $121 million to $160 million—between 1972 and 1974. Little change in the annual level of equipment purchases is predicted for the 1974-78 period because of depressed conditions in the meat processing industry and the lack of significant growth in the dairy, bakery, and other key sectors of the food industry.

Dutch imports of food processing equipment, which are projected to reach almost $70 million in 1978, totaled $63.3 million in 1974 and $49.3 million in 1972. The U.S. share of imports in 1974 was estimated at 16%. U.S.-made equipment is often purchased by dairy products manufacturers and meat processors whose products must comply wtih rigid sanitary standards before they can be exported to the United States. Many users praise the special technical features of U.S.-made items. Also, most potential buyers consider U.S. food processing ma-

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1.00=Dfl. 3.50 (1971); Dfl. 3.24 (1972); Dfl. 2.80 (1973 and subsequent years).

The Netherlands—Economic Indicators
(1973)

Gross national product:	**$62.0 billion**
Total country imports:	**$21.0 billion**
Imports from U.S.:	**$2.2 billion**
Total country exports:	**$21.2 billion**
Exports to U.S.:	**$878.9 million**
Population:	**13.5 million**

chinery to be attractively priced in contrast to the increasingly expensive European equipment.

The market for *food packaging equipment* is expected to grow by almost 9% per year between 1974 and 1978, climbing from $40 million to $56 million. The market level in 1974 reflected an average annual increase of 17.5% above 1972 outlays of $29 million. Food processors investing heavily in packaging equipment—notably for snack foods, beverages, and frozen foods—represent some of the fastest growing sectors of the food industry in the Netherlands.

Imports of food packaging equipment, which climbed from $21.9 million in 1972 to $28.2 million in 1974, are expected to approach $40 million in 1978. U.S.-made food packaging machinery is estimated to have accounted for 9% of 1974 imports.

Competitive Environment

Trade sources indicate that more than 90% of Holland's suppliers of food processing and packaging equipment are situated within a 300-mile radius of Amsterdam. This group would include not only domestic and German suppliers but also some British, French, and Belgian films.

In explaining their apparent preference for European-made equipment, Dutch users typically stress such factors as prompt delivery, ease of obtaining immediate maintenance service, suitability for the types and volumes of food products Holland produces, availability of printed materials (in Dutch) needed by plant personnel, and compatibility of the equipment with the metric system of weights and measures. Grain millers point out that European machinery is more suitable than that of the United States for milling the soft wheats grown in Europe. Dutch brewers cite the lower percentage of product loss obtained with European filling and sealing machinery. This fact is important to them because taxes on alcoholic beverages are levied on the volume produced at the time of fermentation rather than on the number of filled bottles and kegs. Nevertheless, food industry procurement officers emphasize that they are favorably disposed to consider the merits of equipment supplied by sources other than traditional ones.

A review of the competition faced by U.S. manufacturers from both Dutch and third-country suppliers actively selling in this market is presented below.

Domestic manufacture.—The Dutch food processing and packaging equipment industry comprises approximately 80 companies, some of which have common corporate parents. Although the industry specializes in the type of machinery required by the traditionally important sectors of the food industry (dairy products manufacturing, meat processing, and fruit and vegetable processing), most manufacturers are strongly export oriented. Aggressive sales promotion and a high degree of flexibility in meeting the specific needs of their customers have helped Dutch manufacturers of food processing and packaging equipment boost their foreign sales by a considerable margin each year.

Manufacturing subsidiaries of overseas firms do not play a significant role in the industry. American, British, and other leading manufacturers usually serve the Dutch market from their home bases or from factories in other European countries. The Belgian subsidiary of the U.S.-owned Crown Cork Seal Co. (Crown-Baele), however, makes corks at a factory in Rotterdam. The Dupps Company of the United States is involved in a joint venture (Stork-Duke) with Stork N.V. to make equipment for the meat industry at a plant in Beverwijk. Ha-

Table 1.—The Netherlands: The market for food processing and packaging equipment by major processing sectors, 1973, 1974, and 1978

(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment			
Meat, poultry, and eggs	16	14	18
Dairy	42	44	50
Fruit and vegetable	5	6	4
Bakery	13	12	11
Beverages	17	18	15
Other sectors	70	66	66
Subtotal	163	160	164
Food packaging equipment			
Meat, poultry, and eggs	1	1	2
Dairy	6	7	11
Fruit and vegetable	4	5	7
Bakery	3	3	5
Beverages	14	14	12
Other sectors	9	10	19
Subtotal	37	40	56
Total food processing and packaging equipment	200	200	220

Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Dutch trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—The Netherlands: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-1973

(in thousands of U.S. dollars)

	1971	1972	1973
Food processing equipment			
Machinery for milling grains			
United States	14	—	51
Germany	220	185	337
Switzerland	91	227	73
France	—	14	32
Others	7	15	43
Total	332	441	536
Machinery for the bakery industry and for the manufacture of pasta			
United States	99	108	62
Germany	1,265	1,816	2,688
Switzerland	—	90	218
France	167	—	168
Others	446	548	310
Total	1,977	2,562	3,446
Machinery for the confectionery industry and for the manufacture of cocoa or chocolate			
United States	3	37	64
Germany	900	1,593	1,069
Switzerland	—	—	226
France	—	—	116
Others	703	760	184
Total	1,606	2,390	1,659
Machinery for the preparation of meat			
United States	1,094	1,004	1,512
Germany	2,939	2,538	4,113
Switzerland	—	240	246
France	220	—	176
Others	718	669	653
Total	4,971	4,451	6,700
Machinery for brewing and for fruit, vegetable, and fish preparation			
United States	380	88	138
Germany	521	1,018	1,734
Switzerland	—	148	360
France	151	101	163
Others	306	106	337
Total	1,358	1,461	2,732
Packaging equipment[1]			
Machinery for cleaning or drying bottles or other containers; machinery for filling, closing, sealing, capsuling, or labeling bottles or other containers			
United States	935	1,835	1,609
Germany	6,856	8,105	11,439
Switzerland	957	945	1,196
France	872	—	720
Others	1,964	2,237	1,949
Total	11,584	13,122	16,913
Other packing or wrapping machinery			
United States	1,029	751	1,250
Germany	4,837	6,385	9,226
Switzerland	1,200	1,332	1,535
France	—	1,953	1,177
Others	3,045	2,128	2,961
Total	10,191	12,549	16,149

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[1] Since the Netherlands' official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Dutch trade sources to account for 80% of total packaging equipment imports.

Source: Centraal Bureau voor de Statistiek.

mac-Hansella, part of the German-owned Bosch group, produces packaging equipment at a factory in Weert. Winkler den Boer, an affiliate of Fr. Winkler (Germany), manufactures a line of bakery equipment in Holland.

The Stork group of companies, owned by Verenigde Machine-fabrieken (VMF), is by far the largest Dutch manufacturer of food processing and packaging equipment. Fully 90% of its output is exported. Stork-Amsterdam makes a variety of packaging and container handling machinery for the beverage, dairy, and miscellaneous food products sectors, as well as processing equipment for the dairy industry. Stork-Brabant produces complete poultry processing plants; Stork-Friesland, evaporators and spray-driers; Stork-Plaatwellerij, slaughterhouse equipment and batch rendering systems; and Stork-Duke, continuous rendering systems. Also, Stork-Werkspoor Sugar B.V. designs and produces complete sugar refineries, and another Stork subsidiary, Alpha Engineering, custom-designs entire food processing plants.

Other important Dutch manufacturers of food processing equipment include Grenco B.V. (the leading maker of refrigeration equipment), Benier B.V. and van Dijk Machines (both producers of

Table 3.—The Netherlands: Manufacturers' sales of major processed food products, 1971
(in millions of U.S. dollars)

Processed food products	Total sales	Sales to home market	Export sales[1]
Meat products	1,038	479	559
Dairy products	1,470	950	520
Fruits and vegetables	317	203	114
Grain	158	145	13
Bakery products	401	312	89
Sugar	213	n.a.	n.a.
Confectionery products	140	68	72
Cocoa and chocolate	190	82	108
Margarine	188	157	31
Fats and oils	314	128	186
Alcohol and spirits	154	139	15
Beer	252	207	45
Soft drinks	133	129	4
Fish and seafood	35	17	18
Potato starch	38	19	19
Coffee and tea	220	n.a.	n.a.
Mash	1,013	967	46

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[1] Excludes shipments to Belgium and Luxembourg which are included in "Sales to home market."

Source: Centraal Bureau voor de Statistiek.

bakery machinery), Ensink NV (continuous fruit presses), Machinefabriek Finis BV (processing equipment for fruits and vegetables), and Florigo (machinery for making snack foods). Also significant are Goudsche Machinefabriek B.V. (rotary driers and coolers), Machinefabriek W. Hubert & Co. B.V. (dairy apparatus), H. J. Menzing & Zonen B.V. (molding, portioning, breading, and frying machines), Ottevanger Machinefrabrieken B.V. (grain milling equipment), and N.V. Machinefabriek Terlet (mixers, cookers, and pasteurizers for a variety of foods).

Breda Packaging, part of the giant Rijn-Schelde-Verolme Group, is Holland's leading manufacturer of case packaging systems, palletizers, and pallet shrink lines. Berkel Constructie Mij. B.V. is the country's principal maker and largest exporter of weighers. Other key producers of packaging equipment for the food industry include B.V. Essor (case gluers, sealers) and De Hoop Groenpol Industrie Rotterdam B.V. (wrapping and packaging machinery, shrink-tunnels, palletizers, and labeling equipment).

Third-country competition.—Germany is by far the largest supplier of imported food processing and packaging equipment to the Netherlands (see table 2). Geographical proximity and cultural similarities have helped to create the close trading relationships between Germany and Holland that have prevailed for decades. These ties benefit manufacturers of many kinds of goods on both sides of the border.

While German equipment predominates in every sector of the Dutch food processing industry, official trade statistics for 1971-1973 indicate that other European manufacturers are successful in selling types of machinery to Netherlanders. For example, British companies provide machinery (other than presses) used in the refining of edible fats and oils, bakery ovens, and heating equipment used in preparing chocolate and confectionery products. French producers sell fish, fruit, and vegetable processing devices; coffee and tea preparation machinery; filters and other purifiers for edible fats and oils; and heat exchangers. Swiss manufacturers are prominent suppliers of grain mills and grain preparation machinery, continuous conveyor weighers, constant-weight bag fillers, and equipment for the confectionery industry. Swedish firms market dairy and beverage carbonation and purification equipment, and Italian companies sell evaporators, condensers, liquids purifiers, miscellaneous packing and wrapping machinery, and apparatus for the confectionery industry.

Major German companies selling food processing equipment in the Netherlands include Linde (freezing equipment), Winkler & Dunnebier (bakery, sugar, and confectionery machinery), Seeger (brewing equipment), Westfalia Separator A.G. (dairy processing apparatus), Eduard Ahlborn (pasteurizers, heat exchangers, coolers), Braunschweigische Maschinenbauanstalt (sugar and confectionery equipment,) Makat (tabletting machines), Seidelmann (meat cutters), and Werner & Pfleiderer (bakery machinery).

Other European suppliers of processing equipment to the Dutch food industry are Buhler-Miag (grain milling equipment), a Swiss-German firm; FMC-Europe (fruit and vegetable processing and high-capacity freezing equipment), Van Caspel (brewery germination equipment), and Lemartre (vegetable cutters), all of Belgium; Simon Engineering and Gardner (grain preparation equipment), Stella Meta (beverage filters), Baker Perkins (bakery systems), Jahn (cookie fillers), and A.P.V. (dairy machinery) of the United Kingdom; Alfa-Laval AB (dairy equipment and systems) and Frigoscandia (freezing equipment) of Sweden; Herstrup (slaughterhouse lines), Gerstenberg (margarine mixers), and Paasch & Silkenborg (dairy machinery) of Denmark; and Fiffes (sugar refining units) of France.

Principal German suppliers of food packaging equipment to the Netherlands include Hesser Maschinenfabrik (dry products packaging machinery); Holstein & Kappert and Enzinger (bottling equipment); Seitz (miscellaneous food products packaging apparatus); Hamba Maschinenfabrik (fillers for dairy products); Weiss, Kronseder, and August Herbort (labelers); and Chronos (flour baggers).

Additional leading European suppliers include Dawson and Barfos (bottling equipment), Meyer Du-more (packaging machinery for beverages), and Kliklok International (box packaging devices) of the United Kingdom; Sund Emba (Packmasters bottle-handling equipment) of Sweden; Gasti (automatic crating machinery) of Switzerland; F.E.M.I.A. (can and jar fillers) of France; Crown-Baele (bottling equipment) of Belgium; and Portion Packaging (filling machines) of Canada.

The Food Processing Industry

The Netherlands' food processing industry is composed of more than 1,800 plants. Many of these are controlled by one of the world's largest corporations (Unilever) and by several other Dutch-owned firms whose products are known worldwide. Subsidiaries of multinational food processors such as Nestle, Standard Brands, CPC International, and ITT are also represented. Official figures show that in 1971 there were 47 food processing establishments with 500 or more employees, 136 with 200-499 workers, 511 employing 50-199 persons, and 1,141 with 10-49 employees.

Exports are the lifeblood of the Dutch food industry. Holland is a net exporter of processed foods, particularly dairy products, meats, and vegetables. An indication of the relative importance of exports by food industry sector is given in table 3.

The following paragraphs provide a review of the five major sectors (based on levels of annual capital expenditures) of the Dutch food processing industry.

Dairy products manufacturing.—The Netherlands' dairy industry produced 8.9 million metric tons (MT) of milk in 1972, of which 2.2 million MT were consumed as fresh fluid. The remainder was processed to yield 475,000 MT of evaporated and condensed milk, 196,000 MT of powdered milk, 162,000 MT of butter, and 323,000 MT of cheese. Ownership of the sector's 275 establishments (125 of which have at least 50 employees) is highly concentrated; firms controlled by the sector's five largest corporations account for approximately 95% of output. Companies in the dairy industry spent $69 million on capital goods in 1973, compared with $44 million in 1971 (see table 4).

Two farmers' cooperatives—CCF Frico and CMC-Melk Unie B.V.—are among the industry's largest companies. The others are N.V. Nutricia, whose diversified product line includes baby foods and processed vegetables as well as dairy products; Koninklijke Hollandia Fabrieken van Melkproducten en Voedingsmiddelen, a Nestle subsidiary; and Nederlandse Melk-Unie, probably the country's largest marketer of milk for direct consumption.

Dairy products manufacturers are beginning to shift production to their largest and most centrally located plants, closing down smaller operations in the process. Accordingly, milk transportation and storage equipment are in great demand, and there have been some pilot projects involving direct farm-to-factory pipelines.

Table 4.—The Netherlands: Basic data on food processing industry sectors

(values in millions of U.S. dollars)

Sector	Number of employees (1971)	Capital expenditures (1971)	(1973)
Meat, poultry, and eggs	22,600	28	40
Dairy	24,800	44	69
Fruit and vegetable	10,000	12	16
Grain	1,700	2	8
Bakery	19,900	19	27
Confectionery	13,200	14	19
Fats and oils	8,800	15	10
Beverages	14,000	33	55
Fish and seafood	1,500	3	2
Miscellaneous food products[1]	26,700	86	91

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[1] Includes sugar.

Source: Centraal Bureau voor de Statistiek.

Nederlandse Melk-Unie prepares fluid milk, bottled evaporated "coffee-milk," bottled custards, and other products for delivery to homes and retail stores. The firm's Rotterdam plant, which is considered typical of other Dutch milk processing facilities, has an annual throughput of 500 million liters. Some of the equipment installed there includes coolers and pumps made by Alfa-Laval (Sweden), A.P.V. (United Kingdom), Stork (the Netherlands), Paasch & Silkeborg (Denmark), and Eduard Ahlborn (Germany); evaporating condensers and cooling tanks from Baltimore Aircoil Co. (United States); centrifuges from Alfa-Laval and Westfalia Separator A.G. (Germany); and pasteurizers from Alfa-Laval, A.P.V., and Paasch & Silkeborg. Homogenizers are from Manton-Gaulin Mfg. Co. (United States); tank and pipeline cleaning sets from A.P.V. and from Ladish Company, Tri-Clover Division of Kanosta (United States); bottle unpackers from Leiffeld und Lemke (Germany); filling equipment from Elopak, Marja, and Stork (the Netherlands) and Hamba Maschinenfabrik (Germany); and automatic crating machinery from Gasti (Switzerland). Paper packaging equipment was obtained from Blockpack (Germany), Tetra Pak (Switzerland), and Pure-Pak (the Netherlands).

Meat, poultry, and egg processing.—Holland's output of processed meat and poultry products in 1972 was placed at 204,000 MT. Approximately half the production is exported. There are 185 establishments in this industry, 90 of which have 50 or more employees. The five largest companies—Unox-Zwanenberg (Unilever), Stegeman (owned by a livestock feed manufacturer), Homburg (owned by Lyons, a British firm), Coveco (a farmers' cooperative) and U. Vlees-Holten—are said to account for 25% of production. Capital expenditures by meat, poultry, and egg processors totaled $40 million in 1973, up from $28 million in 1971.

The Dutch meat products industry has suffered a sharp drop in foreign demand for its goods since 1971. The revaluation of the guilder relative to the dollar has led to greatly reduced Dutch exports of canned hams to the United States. In addition, there has been a general surplus of pork throughout Europe. Most contracts with hog producers were concluded at price levels that now generate losses for the processors. Moreover, East European nations are developing meat processing industries that may well be able to sell their products more cheaply than those in Holland. Dutch firms hope that demand will recover by 1978, but under the circumstances they are postponing plant expansions and the adoption of more mechanized production methods.

Several firms in the industry have been acquired by larger domestic or foreign companies within the last 5 years. Unox recently bought Zwanenberg, thereby uniting two of Holland's largest meat producers under Unilever ownership.

Canned meat, fresh meat, sausages, delicatessen meats, soups, snacks, and frozen dinners are produced at the Unox factory in Oss. Annual output is estimated at 15,000-20,000 MT. Some of the equipment installed in this plant, illustrative of that used in other large meat processing establishments, includes large boning machines from Stephen Paoli Mfg. Co., derinding apparatus and compactors from Townsend Engineering Co., and ham injectors and high-speed slicers from The Allbright-Nell Co. (all U.S. firms); meat cutters and saws from Seidelmann and other Germany manufacturers; and can closers from Thomassen en Drijver (a Dutch affiliate of the Metal Box Co. of the United Kingdom and of Continental Can of the United States). Dutch manufacturers supplied the beaters, brining devices, frozen meat flakers, dehairing equipment, and gutting machinery.

Beverage manufacturing.—Dutch per capita consumption of beverages in 1973 was 73 liters of beer, 58 liters of soft drinks, 9 liters of wine, and 2.5 liters of hard liquor. Beer production in that year totaled 1.1 billion liters, of which 149.9 million liters was exported. Foreign markets absorbed approximately 12% of the total soft drink output of 877 million liters. The Netherlands does not produce wine, but does import some in bulk for local bottling. Liquor production consists primarily of liqueurs.

Holland's beverage manufacturing industry in 1972 included 120 soft drink bottling plants, 22 breweries, and a number of distilleries. The five largest enterprises—Raak (Grace), Vrumona B.V. (a Heineken-owned, Pepsi-Cola licensee), Hero (Swiss-owned), Coca-Cola, and Bavaria—together account for approximately 60% of soft drink sales. Four of the 15 companies that operate breweries account for 90% of beer sales. These are Heineken, N.V., Verenigde Nederlandse Brouwerijen Breda-Oranjeboom N.V. (Allied Breweries), Grolsch Bierbrouwerijen N.V., and Stella Artois (Belgian-owned).

The beverage industry as a whole spent $55 million on capital goods in 1973, compared with $33 million in 1971. Heineken's construction of a fourth brewery in 1973 and 1974 was a key factor in boosting the level of sector investments. Breda-Oranjeboom, which has three breweries, is planning to spend $1.5 million to build a fourth. The Bavaria brewery, a rapidly-growing newcomer to the industry, is investing some $1 million annnually in plant and equipment. Soft drink manufacturers are deferring any substantial new investments until they can assess the effect on consumption of a new tax on carbonated beverage sales. Nevertheless, several small firms are expected to proceed with plans to buy high-speed bottling equipment.

Bakery products manufacturing.—Small enterprises dominate the bakery industry; as of 1971, there were only 352 establishments that employed more than 10 people. Meneba, the country's largest flour miller, also is the leading industrial baker of bread. The four or five other bakeries that distribute bread nationwide rank well behind Meneba, whose share of the market reaches 40% to 60% in some of the larger cities. Neighborhood bakeries, meanwhile, are holding their own in bread sales; in fact, some observers maintain that their popularity is increasing.

The pastry and miscellaneous baked goods sector of the industry produced 104,000 MT of pastry, 21,000 MT of rusks, 59,000 MT of cookies, and 29,000 MT of cake in 1973. Local bakeries are important in this sector, but there are a number of large national producers. The largest is Koninklijke Verkade Fabrieken N.V., a family-owned concern that is well-known in foreign markets for chocolates and cookies. Other major firms are Biscuitfabriek Patria B.V. (a subsidiary of Meneba), De Gruyter B.V., Albert Heijn N.V., and N.V. Biscuit-en Chocoladefabriek Victoria. Hooimeyer and Bolletje are the two leading bakers of rusks.

Fruit and vegetable processing.—Holland is one of the leading producers of processed fruits and vegetables for the European and other world markets. Dutch firms processed 323,000 MT of fresh vegetables and 123,000 MT of fresh fruits in 1972. More than 50% of the vegetables were canned, 18% were frozen, 16% were pickled, and 7% were dried. Almost 60% of the fresh fruit processed consisted of apples to be made into sauce, while 12% of the fruit was preserved in syrup, 10% was frozen, 8% was made into juice, and 4% became pulp or jam. The fruit and vegetable processing industry's capital expenditures amounted to $16 million in 1973, compared with $12 million in 1971.

Most of the approximately 100 fruit and vegetable processing establishments are relatively small. Those owned by Unilever companies, by far the largest in their respective product specialties, include Lucas Aardenberg B.V. (deepfrozen and canned fruits and vegetables), Koninklijke Mij. De Betuwe N.V. (jams and juices), Iglo B.V. (frozen fruits and vegetables), Unox (canned soup), and Royco (dried soup). Other important manufacturers are Groko B.V. (a subsidiary of ITT, and Iglo's principal competitor in the production of frozen fruits and vegetables), Hak Conservenfabriek (the market leader in glass-packed fruits and vegetables), the Swiss-owned N.V. Hero Conserven Breda (particularly strong in the fruit juice market), and the more diversified firms of H.J. Heinz N.V. and N.V. Nutricia.

Export sales of Dutch frozen fruits and vegetables are soaring. Trade sources expect the market to expand 10-15% annually during the next several years. Accordingly, both Iglo and Groko plan to enlarge their production facilities. Sales of most other fruit and vegetable products are also rising, but Holland's processors of canned goods are encountering stiff competition both at home and abroad from East European, French, and Taiwanese exporters. Businessmen in this area therefore are much more cautious in planning their future capital investments.

Trade and Technical Regulations

Customs duties levied on food processing and packaging equipment imported into the Netherlands from nations outside the European Economic Community range from 5% to 9%. All imported machinery is subject to a 16% value-added tax which compensates for similar taxes levied on equipment of domestic manufacture. Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

The characteristics of the Netherlands' electrical power supply are 220 volts, 50 hertz, 2- and 3-phase. The metric system of weights and measures is the statutory standard.

Information on the availability of published standards for food processing and packaging equipment in the Netherlands may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on the Netherlands to supplement this report is available on a continuing basis from:

Country Marketing Manager—The Netherlands
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-3355

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in The Netherlands," DIB 74-12-534, August 1974.

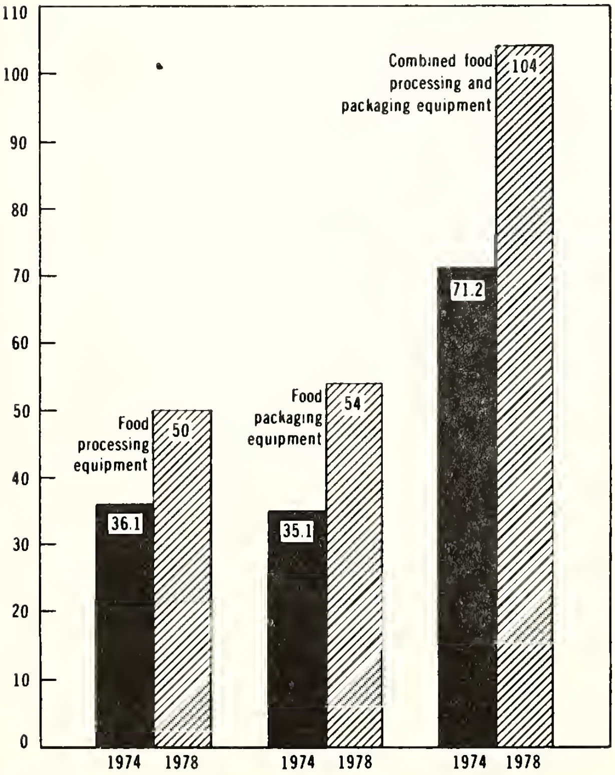
The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food Processing and Packaging Equipment—The Netherlands" which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

Spain

The food processing and packaging equipment market in Spain offers increasing sales opportunities as changing consumer tastes and new government programs stimulate rapid growth in the food processing industry. Expanding world demand for many types of foods processed in Spain is another factor stimulating development of this industry. The resultant growth will strengthen existing markets for high-capacity, automated machinery and create new demand for the kind of technologically sophisticated equipment offered by many U.S. manufacturers.

Spain: Food processing and packaging equipment market, 1974, and 1978.

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Spanish trade source estimates and projections of equipment purchases ultimately made by domestic end users.

From the 1972 level of $45.3 million,[1] combined food processing and packaging equipment sales increased to $71.2 million in 1974. Estimates place 1978 sales at well above $100 million (see table 1), reflecting an average annual growth rate of almost 10% between 1974 and 1978.

The market for *food processing equipment* has shown a steady pattern of growth. Sales rose from $26.4 million in 1972 to $36.1 million in 1974. An average annual growth rate of 8.5% is foreseen for the next several years, bringing 1978 sales to $50 million. Spanish imports of equipment for food processing amounted to $28.1 million in 1974; the U.S. share of these sales was 9.5%, or almost $2.7 million. Imports should rise to nearly $40 million by 1978, with U.S. producers selling $3.5 million.

The *food packaging equipment* market is forecast to exhibit particularly rapid growth, stimulated to a large degree by the government-promoted trend toward prepackaging of items traditionally sold in bulk. Sales increased from the 1972 level of almost $19 million to $35 million in 1974; between 1974 and 1978, projected growth at an average annual rate of 11.4% should bring the market to $54 million in the latter year. Imports were valued at $14.7 million in 1974, and 7.5% or $1.1 million of the imported equipment came from U.S. sources. The value of imports is expected to reach $22 million in 1978, with American suppliers' share increasing to 8.2%, or almost $1.8 million.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1 = Pts 70 (1971); Pts 66.5 (1972); Pts 57 (1973 and subsequent years).

Spain—Economic Indicators
(1973)

Gross national product:	**$61.4 billion**
Total country imports:	**$9.1 billion**
Imports from U.S.:	**$1.5 billion**
Total country exports:	**$5.1 billion**
Exports to U.S.:	**$710 million**
Population:	**34.5 million**

Competitive Environment

Local firms, which cater to the large market for low-volume equipment, virtually control sales to the numerous small companies in the Spanish food processing industry. Lower labor costs and protective tariffs discourage competition from foreign makers of such equipment.

European firms dominate sales of medium-capacity equipment, owing to the price advantage that their products enjoy over units imported from the United States. Another factor favoring European suppliers is the establishment of manufacturing affiliates in Spain by several of the leading firms such as Seitz of Germany, La Girondine of France, and Stork of the Netherlands. These affiliates serve as sales and importing organizations for the more advanced machines produced in parent factories.

Sales of extremely high-speed, specialized, or advanced types of equipment not yet available from other sources continue to be the major strength of American manufacturers in the Spanish market. Although proximity and long-established local sales and service organizations give European companies some sales advantage, it is expected that the future development of the Spanish food processing industry will require the sophistication currently found only in many American products. For example, most machinery used in tomato processing has been supplied heretofore by Italian manufacturers; however, as tomato farming is mechanized with high-speed American harvesters, Italian technology will be hard pressed to provide equipment of adequate capacity, and, for that reason, U.S. suppliers should be able to penetrate this market.

A brief overview of the Spanish and third-country competition faced by U.S. food processing and packaging equipment suppliers in this market follows.

Food processing equipment.—Domestic firms have supplied roughly 60 to 65% of the Spanish food industry's processing equipment in recent years. Generally, they make large production fixtures such as conveyors and sorting tables, and their customers primarily are small processing businesses employing fewer than 100 people.

Among the major wholly Spanish-owned firms manufacturing food processing equipment are Industrial Electromecanica Feriel (meat preparation machines); David Ferrer S.A. (milk processing units and presses for oil extraction); Jose Lizondo Perez (ovens, blanchers, and retorts for rendering fat); Industrial Salva S.A. (ovens, bakery equipment, and fermentation tanks); Talleres Lago S.L. (bakery apparatus); Metalurgica del Tormes S.A. (milling equipment); Estudios y Proyectos Industriales S.L. and Maquinista y Funciones del Ebro S.A. (sugar refining units); Bender S.A. (winemaking, soft drink processing, and brewing equipment); and Baeza y Matau S.R.C. (freezing and refrigeration systems).

Leading Spanish manufacturing subsidiaries of foreign firms, with the nationality of the parent company shown in parentheses, include Stork Inter-Iberica (the Netherlands), which produces milk processing systems and sterilizers; La Girondine (France), winemaking apparatus; Baele Iberica (Belgium), brewing and dairy equipment; FMC (Belgium and United States), a complete line of food processing machinery; Alfa-Laval AB (Sweden), dairy equipment; Seitz Iberica (Germany), filtration systems for beverage processing; and Buhler S.A. (Switzerland), milling equipment.

German and Italian enterprises are the major third-country competitors of U.S. industry in Spain's food processing equipment market (see table 2). German products favored in 1973 included cream separators and clarifiers, oil and oilseed extractors, dairy machinery, and ovens; Italian-made items included freezing tunnels, cream clarifiers, and presses and crushers. Suppliers from France, the Benelux countries (Belgium, the Netherlands, Luxembourg), and Sweden are also significant competitors.

Among the important third-country firms actively selling their products in the Spanish market are

Table 1.—Spain: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food Processing Equipment (by sector)			
Fruit and vegetable	12.9	14.5	22
Fish and seafood	2.0	2.2	3
Beverages	14.0	14.9	19
Other sectors	3.7	4.5	6
Subtotal	32.6	36.1	50
Food Packaging Equipment			
Machinery for cleaning and drying bottles	2.2	3.0	7
Other machinery for filling, sealing, labeling, etc.	27.6	32.1	47
Subtotal	29.8	35.1	54
Total food processing and packaging Equipment	62.4	71.2	104

Source: Bureau of International Commerce, Office of International Marketing research report. Values based on Spanish trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Spain: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-73

(in thousands of U.S. dollars)

	1971	1972	1973
Food Processing Equipment			
Industrial and laboratory ovens [1]			
United States	—	—	175
Germany	257	45	211
Italy	29	60	158
Sweden	43	45	53
Others	14	241	123
Total	343	391	720
Pasteurizers and sterilizers			
United States	—	211	—
Benelux countries	772	857	1,789
France	471	466	596
Sweden	71	165	228
Others	86	165	422
Total	1,400	1,864	3,035
Presses and crushers for wine, cider, etc.			
United States	43	60	88
France	143	226	474
Italy	114	105	316
Germany	—	45	210
Others	14	—	—
Total	314	436	1,088
Milling machinery for grains, cereals, dried vegetables, etc.			
United States	29	30	35
Germany	143	180	281
Italy	129	165	246
Switzerland	70	91	193
Others	143	165	263
Total	514	631	1,018
Other than dairy, milling, and oil extraction			
United States	443	617	1,579
Germany	1,043	2,045	3,982
Italy	786	812	2,386
United Kingdom	186	331	509
Others	1,271	1,594	2,825
Total	3,729	5,399	11,281
Packaging Equipment [2]			
Machinery for filling, sealing, labeling, etc.			
United States	857	677	1,719
Germany	4,400	4,647	8,754
Italy	1,971	3,955	4,158
France	1,186	1,669	2,632
Others	2,086	3,848	6,474
Total	10,500	14,796	23,737

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[1] Since Spanish official trade statistics do not differentiate between processing equipment for food and non-food uses in this equipment category, both types of equipment are included in these figures.

[2] Since Spanish official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Spanish trade sources to account for 47% of total packaging equipment imports in 1971; 46% in 1972; and 46% in 1973.

Source: Dirección General de Aduanas Ministerio de Hacienda.

Alfa-Laval AB of Sweden (dairy processing systems), A.P.V. Co. Ltd. of the United Kingdom (dairy machines and brewery equipment), Baele of Belgium (dairy processing apparatus), Manzini of Italy (fruit and vegetable processing machinery), and Seitz of Germany (beverage processing units). FMC-Europe of Belgium and Stork-Amsterdam of the Netherlands provide a full range of food processing equipment to Spanish food processors.

Food packaging equipment.—Sales of food packaging equipment in Spain are also dominated by domestic suppliers, who provided about 55 to 60% of the packaging units sold to the food processing industry in 1972. In this case, too, local output is concentrated on low-volume, basic items for small processing concerns.

The largest locally owned firms making food packaging apparatus include Hijo de J. Pruna Maynou (wrapping equipment and shrink-tunnels), Bender S.A. (bottling and packaging systems), Constructiones Mecanicas Safimo S.A. (cartoning machinery), and Talleres Saez (canning and filling devices). Others include Industrias Roure and Talleres Olive.

Major Spanish manufacturing subsidiaries of foreign firms, and the nationality of the parent, include Jagenberg Iberica S.A. (Germany), which makes labeling machines; Baele Iberica (Belgium) and La Girondine (France), bottling equipment; Chelle Espanola S.A. (France), bottle-capping equipment; and Strapex S.A. (Switzerland) carton-sealing devices.

German and Italian industries are the primary sources of Spain's imported food packaging equipment. Companies from France, Sweden, the Benelux countries and the United Kingdom also have penetrated this market. Leading third-country suppliers are Jagenberg and Seitz of Germany, Manzini of Italy, Baele of Belgium, and La Girondine of France.

Table 3.—Spain: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1972*

Sector	Large	Medium	Small
Meat, poultry, and eggs	1	3	161
Dairy	—	6	2,097
Fruit and vegetable	13	193	891
Grain	—	4	11,771
Bakery	2	19	36,406
Sugar and confectionery	10	54	1,889
Fats and oils	—	11	841
Beverages	6	61	5,767
Fish and seafood	6	48	951
Miscellaneous food products	1	19	3,315

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[1] Large = 500 or more employees
Medium = 101-499 employees
Small = 100 or fewer employees.
Source: Spanish Ministry of Industry.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find favorable opportunities for sales of the following types of equipment to the three major sectors of the Spanish food processing industry.

Food Processing Equipment

Beverages.—Clarifiers, presses, filtering machinery, and sterilizing systems.

Fruit and vegetable.—Chemical peelers, paring machines, corers, cooling/freezing equipment, sterilizing systems, and recording thermometers for time/temperature cook cycles.

Fish and seafood.—Filleting, scaling, and shelling machines; liquid nitrogen tunnel-freezers; refrigerated bulk cooling tanks; continuous mixing/whipping/chilling units; sterilizing systems; and recording thermometers for time/temperature cook cycles.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquids and dry products.

Wrapping, packing.—Outer wrappers and bottling systems.

Marking, inspecting.—Optical inspection units for the beverage industry and imprinting equipment.

Container/product/package preparation and handling.—Carton closing and sealing equipment, palletizers, and unloaders.

The Food Processing Industry

Although food processing is one of Spain's most important industries, its structure remains fragmented among thousands of small enterprises, family businesses, and local wineries. There were only 418 medium-size operations (i.e., those with 101 to 500 employees) and 39 larger firms (500 or more employees) in 1972 (see table 3). Capital expenditures by all food processors in 1971 amounted to $69.9 million, and the value of production totaled $7.9 billion (see table 4).

The expanding export market for processed food, the influx of tourists, and a slow but noticeable change in consumer tastes all favor continued advancement of the industry. Government economic plans also are influencing the industry's development. The Third Plan (1972-75) calls for investment of $754 million by public and private sectors in new and expanded food processing facilities. The plan contains specific provisions for development of dairy, meatpacking, fruit and vegetable processing, and sugar refining industries, with large sums earmarked for credit or direct capital assistance by the government. This support in some cases calls for direct or partial government ownership of individual factories through the Instituto Nacional de Industria.

A major area of growth in the Spanish food processing industry is the production of prepared frozen meals and other types of frozen and convenience foods. Although the market for quick-freezing equipment forms a minor portion of total equipment sales at present, future development should be significant. There has been a noticeable increase in the amounts of frozen fruits and vegetables exported to the European market. Frozen concentrated orange juice exports have grown spectacularly, reaching approximately 3,700 metric tons (MT) in 1970. In addition, increasing quantities of fish and seafood are being processed and frozen at sea. Most of the frozen foods now being marketed in Spain are sold through supermarkets in the Madrid area. The major obstacle to growth of the quickfreezing industry is the lack of proper storage, distribution and retail sales facilities. The Government in its Third Plan is extending credits for and making sizable direct investments in both frozen food production and distribution facilities.

Expansion is also foreseen in the food packaging equipment market as new product lines such as prepared meals and dried soups require new types of packaging and as new materials become available for containers. Use of plastics has increased at a significant rate in the last few years. Approximately 40% of fluid milk is packaged in plastic bags, and at least another 50% reaches the consumer in semirigid plastic bottles. Bottled water and domestic oils are other products now merchandised in plastic receptacles. A market is expected to develop for the boilable plastic pouch used as a container for prepared foods. Except for cardboard tetrahedonal milk cartons, paper use generally is not increasing, because it is being replaced by plastics. The use of metal foils and stamped trays for prepared dinners should increase considerably in the future.

The beverage, fruit and vegetable, and fish and seafood sectors of Spain's food processing industry, discussed below, are the best potential markets for American-made equipment. Unlike other sectors which are highly labor-intensive and do not yet provide good sales opportunities, these three are developed or developing, and expansion is seen likely.

Beverage manufacturing.—Beverage production constitutes the largest sector of the food processing industry in Spain. Sherries, table wines, and brandies are well known Spanish exports; beer, Coca-Cola, Pepsi-Cola, Schweppes, and La Casera drinks are leading products made for domestic consumption. Output of beer and malts increased from a 1969 level of 1.08 billion liters to 1.38 billion liters in 1972. Wine and brandy production also expanded during this period from 89.9 million liters to 109.2 million liters. Output of nonalcoholic beverages in 1972 was approximately 1 billion liters.

Although almost 6,000 enterprises were involved in beverage processing in 1972, only 303 companies employed more than 26 persons. Of these, 61 firms had 101 to 500 workers and 6 employed 500 or more people. Fixed assets for the beverage industry in 1973 were $168 million.

Within the beverage processing sector as a whole, there is a tendency toward consolidation of smaller firms. This trend has been particularly evident among the producers of soft drinks and bottled water and the numerous local wineries. Current government programs designed to reduce fragmentation support centralized, cooperative processing and storage facilities with shared use of bottling and packaging equipment.

In each of the major subsectors (beers and malts, wines and brandies, and nonalcoholic drinks) a few large corporations virtually dominate production. The leading brewing concern is El Aguila S.A., whose output makes up 30% of the national total. Two smaller firms, El Azor and El Gavilan, operate as independent companies, although they are under the control of El Aguila. Three Spanish breweries are subsidiaries of the Joseph Schlitz Brewing Company of Milwaukee: Cervecerias Espanola S.A., La Cruz del Campo S.A., and Henninger Espanola S.A. Two other internationally sold beers, San Miguel and Skol, also are made under foreign license in Span.

Compania Coca-Cola de Espana S.A., the largest nonalcoholic beverage producer, controls and promotes a group of 14 independent, franchised bottlers producing Coca-Cola, Fanta, and Findley Tonic. Similar organizations make Pepsi-Cola, Schweppes, 7-Up, Canada Dry, and California Mission Orange. The only Spanish-owned company that operates on a nationwide scale is La Casera S.A., which produces orange-, lemon-, and cola-flavored soft drinks, and purified bottled water. Coca-Cola, Pepsi-Cola, Schweppes, and La Casera account for about 75% of the total national output, even though their installations constitute less than 5% of the 2,100 nonalcoholic beverage factories.

Although more than 14,000 wineries were listed in the last census of the industry, about 600 produce over 95% of the entire vintage. Brandy production is controlled by five huge family concerns, and these bottle at least 90% of both brandy and sherry. The Rumasa group is one of the largest wine producers. This holding company, owned by the Ruiz Mateos family, operates a number of separate enterprises, including Williams & Hubert, the makers of Dry Sack sherry. Other large firms include Pedro Domecq S.A., Gonzalez Byass & Co. Ltd., Fernando A de Terry S.A., Antonio Bobadillor, Osborne y Cia., and Garvey S.A.

Most breweries and soft drink factories now operate with some excess capacity, and so future equipment purchases will be directed primarily toward modernization of facilities. The wine industry will be purchasing new equipment to expand production capacity in some areas of the country, especially in the central and Rioja areas.

The operations at La Cesera S.A., one of the major producers of soft drinks and bottled water, typify those of the larger Spanish-owned companies involved in beverage manufacturing. This firm uses in its 50 bottling plants an assortment of equipment

Table 4.—Spain: Basic data on food processing industry sectors, 1971

(values in millions of U.S. dollars)

	Production	Production (quantity)	Capital expenditures
Meat, poultry, and eggs	2,609	354,386 tons	0.14
Dairy	603	2,830,000 hectoliters	1.18
Fruit and vegetable	239	765,000 tons	12.15
Grain	673	3,275,198 tons	3.53
Bakery	820	2,752,880 tons	15.14
Sugar and confectionery	375	751,735 tons	6.34
Fats and oils	126	565,700 tons	4.24
Beverages	914	28,741,000 hectoliters	19.66
Fish and seafood	177	121,778 tons	3.53
Miscellaneous food products	1,406	n.a.	4.01

Source: Spanish Ministry of Industry.

made by a variety of producers, Output in 1973 was approximately 100 million liters, or about 10% of the national production of nonalcoholic beverages.

The first step in one of the approximately 110 processing lines at La Casera involves purification of water. Most installations use a combination of mechanical filters, osmosis exchange inverters, carbon filters, Silex filters, resin exchange, dechlorinization, and, in some, desalinization equipment. The most commonly used units are made by Ajax of the Netherlands or Seitz, a German firm with a Spanish manufacturing subsidiary. Purification is followed by in-line blending and carbinization processes in which Spanish-made equipment and pumps are used. Bottle-washers, which in most of the newer installations are made by the Spanish affiliate of the French firm, La Girondine, are utilized in subsequent operations. With few exceptions, fillers also are made by the local subsidiaries of Seitz or La Girondine. Labeling of soft drinks is not necessary, as most of the bottles have permanently painted labels. Handling, palletizing, packing, and unpacking operations have been automated to some extent. Conveyers are mostly Spanish, and the most common palletizing systems are produced by the German manufacturer, Ortman and Herbst. The lift trucks employed are manufactured by the British company Fennic and the American firm Hyster.

Fruit and vegetable processing.—The total output of the fruit and vegetable processing industry was 985,000 MT in 1973, up from the 760,000-MT production of 1970. Firms employing over 250 persons constitute approximately 10% of the total number of companies and account for 75% of the output. The industry's fixed assets in 1973 were about $148 million.

Although there were over 1,000 fruit and vegetable processors operating in 1972, the industry is dominated by a few large corporations, most of which are members of international groups financed by foreign capital. The most important of these are Conservas Ibericas (Cavinam Group, United Kingdom and Belgium); Gallina Blanca Group S.A. (Borden Foods Co., Ralston Purina Co., U.S.A.); Kraft Leonesas S.A. (Kraft Corp., U.S.A.); and Industrias Riera Marsa S.A. (Standard Brands Inc., U.S.A.). The formation of larger companies from groups of small processors should continue, owing to government pressure to reduce fragmentation.

Though the most important factories in Spain function at technical levels approximately equivalent to those of American and European facilities with similar capacities, processes in many medium- and small-size concerns remain extremely labor-intensive. Freezing is not widely used at present, although considerable expansion is forecast in this area. The most commonly employed packaging technique is preservation in cans and glass jars.

Growth in the fruit and vegetable processing industry is continuous, with most companies reinvesting about 10% annually in expansion programs. Total 1974 investments for capital improvements were about $18.8 million. Many factories have been built since 1961, and the tendency is toward enlargement of existing facilities rather than construction of new plants. The major improvement slated for the immediate future is introduction of automation to reduce manpower requirements.

The processing of tangerine segments in the Murcia factory of Conservas Ibericas S.A. exemplifies the technological level of many Spanish methods for fruit and vegetable preservation. The first steps in the line, which operates at a capacity of about 300 jars per minute, are scalding (to loosen peel) and peeling by hand on three-belt conveyor sorting tables. Next, the segments are dried in an air blast and continuous drying tunnel. After being sectioned by hand on three-belt conveyor tables, the fruit is scaled in a lye solution to remove fibers and then washed in 20-meter (m) chutes. Bleaching with hydrochloric acid and more washing in 20m chutes follow. Next in the process are mechanical sorting, by means of roller-type equipment, and hand-packing in glass jars. The containers are filled with syrup preheated to 80°C to 90°C, vacuum sealed with twist-off tops, and subjected to continuous sterilization before they are labeled, packed, and stored. Most of the equipment used is of Spanish manufacture, supplied primarily by Macomur. Two American companies, FMC and Angelus Sanitary Can Machine Company, produced some of the filling and topping machinery. French Sterioflam equipment is utilized in the sterilization process, and labeling devices are from Jagenberg of Germany.

Fish and seafood processing.—This industry exhibits particularly good sales potential for American firms, because the current diversification of products and modernization of equipment will require new purchases at a higher than normal rate during the next few years. A total of 108,645 MT of fish and seafood was processed in 1969; in 1972 the output was 119,500 MT. Although more than 1,000 enterprises are involved in fish and seafood processing, this industry is almost completely dominated by 4 giant companies: Pescanova S.A., Masso Hermanos S.A., Conservas Garacilla S.A., and Hijos de Carlos Alba S.A. Together they produce more than 45% of the counrty's output. Family ownership of enterprises is the rule with only one major exception: the Alimentos Pleamar group, which distributes products of 13 processing companies under the Pleamar label.

The biggest recent change in the industry has been replacement of older fishing trawelers with large, modern "factory" ships which stay at sea as long as 6 months, preprocessing and freezing the catch. About 30 of these 100-m vessels are built each year and equipped with gutting, cleaning, filleting, and freezing machinery.

The fixed assets for the entire industry in 1973 totaled $34.5 million, excluding installation of equipment on factory ships and the value of the ships themselves. Although the larger firms are continually expanding in response to healthy growth in sales, no mergers are forecast for the near future, and little possibility exists for formation of new companies. The most significant anticipated technological development is the automation of production in the large facilities.

The Masso Hermanos S.A. fish-packing plant in Vigo processes a variety of fish and seafood products, including tunafish, anchovies, sardines, mussels, squid, octopus, whale meat, fish meal, prawn pate, fish soups, and other items. Gross value of 1973 production was about $20 million, and most items were exported. Although this plant is the largest facility of its type in Europe, much of the work is performed by hand. Operations on a sardine-packing production line start with receiving the fish through chutes and canals in which they are floated with a controlled stream of water. Evisceration is done by semi-mechanized Danish equipment, supplied by Holms MaskinFabrik, augmented by a considerable amount of hand labor. After flattening, sardines are carried through drum-type continuous washers that utilized high-pressure water sprays. This equipment was manufactured by Talleres de Ochandia of Spain. Cooking takes place in a tunnel oven of Spanish origin built by Hermanos Rodriguez Gomez. Packing is an entirely manual operation; hundreds of women seated at long conveyor tables hand-sort and hand-pack the sardines into cans, which are automatically filled with tomato sauce, oil, or vinegar sauce. Topping and sealing are done by machine, but the process is complicated because different sizes of cans are required by many individual countries to which the products are exported. For this reason, several types of toppers are used, of which equipment from FMC of Belgium is most common. Sterilizing with high-pressure steam takes place in autoclaves that are primarily of Spanish manufacture. Labeling and packing operations are simplified by use of lithographed cans and cardboard boxes.

Trade and Technical Regulations

Current tariff rates for imported food processing and packaging equipment range from 5 to 27%. The Spanish government uses adjusted levels of duties to protect local manufacturers, and as new items are added to domestic production, duties on comparable imported items are raised to a protective level of 24 to 27%. Equipment not manufactured locally, however, is subject to much lower duties to encourage expansion of the food processing industry. In addition, the tariff rates for highly specialized machinery may be reduced under Law Decree 2790/65; when such special dispensation is granted, the duty usually is dropped to a token payment, often as low as 1 to 5%.

Information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

American technical standards usually meet or exceed those of the Spanish industry and therefore do not present problems for U.S. manufacturers. The electrical installations require modification, since all Spanish factories operate on 50 cycles rather than the 60-cycle standard of the United States. Normal voltages are 110V and 220V in single-phase and 220V (between phases) in 3-phase. A few installations are 380V (between phases) in 3-phase. These differences necessitate supplying 50-cycle motors and synchronous devices. Spain uses the metric system of weights and measures.

Further information on the availability of published standards for food processing and packaging equipment in Spain may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Spain to supplement this report is available on a continuing basis from:

Country Marketing Manager—Spain
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-3957

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in Spain," DIB-74-09-508, July 1974.

The Office of Export Development also has available for $3.00 a "Target market Trade List: Food Processing and Packaging Equipment—Spain" which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

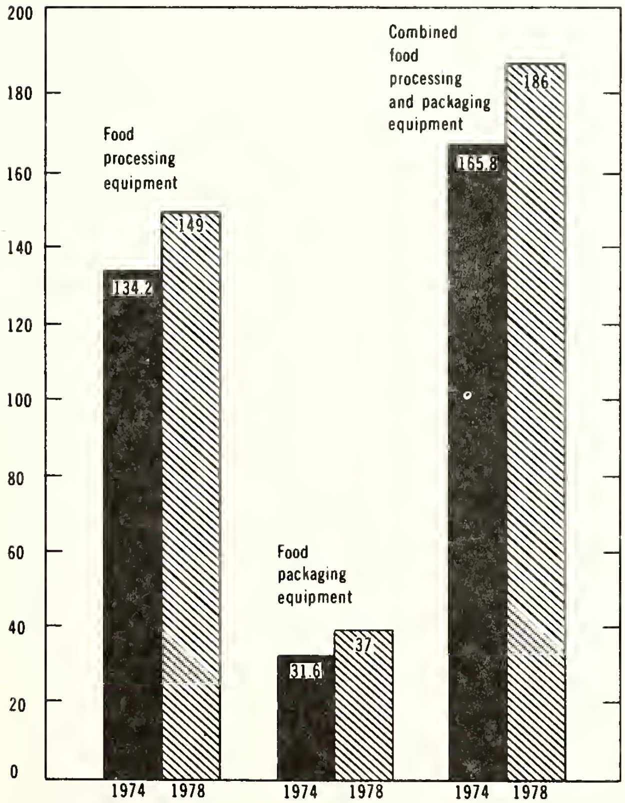
Sweden

Growth of the food processing and packaging equipment market in Sweden reflects a continuing rise in the country's overall standard of living and an accelerating demand for convenience foods. Combined food processing and packaging equipment sales have risen slowly but steadily in recent years, increasing from $147 million [1] in 1972 to more than $165 million in 1974. The market is predicted to exceed $185 million in 1978 (see table 1).

Swedish food processors obtain their equipment primarily from local manufacturers but generally purchase highly specialized machinery from foreign sources. Domestic firms currently supply roughly 75-80% of the processing and 70% of the packaging equipment market. Imports exceed the remaining domestic requirements because significant portions of the equipment supplied by foreign manufacturers are incorporated into Swedish-made systems and reexported.

Sweden: Food processing and packaging equipment market, 1974 and 1978

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Swedish trade source estimates and projections of equipment purchases ultimately made by domestic end-users

Sales of *food processing equipment* are projected to approach $150 million in 1978, up from $134 million in 1974 and $116 million in 1972. Imports of this equipment in 1974 totaled $95 million, of which the U.S. share was 10%. Trade sources place 1978 imports at $110 million, with American manufacturers continuing to account for 10%.

The market for *food packaging equipment,* which totaled $30.9 million in 1972, only reached $31.6 million by 1974. Sales are predicted to grow at a modest 4% annual rate until reaching a $37-million level in 1978. Imports of packaging equipment by the food industry in 1974 amounted to $19.5 million, of which the American share was 20%, or $3.9 million. Trade sources foresee an increase of yearly imports to slightly over $20 million by 1978, with the U.S. share remaining steady at 20%.

Competitive Environment

U.S. industry's competition from both Swedish and third-country suppliers active in the local market for food processing and packaging equipment is profiled below.

Food processing equipment.—Approximately 60

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1 = Skr 5.12 (1971); Skr 4.76 (1972); Skr 4.36 (1973 and subsequent years).

Sweden—Economic Indicators
(1973)

Gross national product:	**$50.4 billion**
Total country imports:	**$10.6 billion**
Imports from U.S.:	**$705 million**
Total country exports:	**$12.2 billion**
Exports to U.S.:	**$738 million**
Population:	**8.2 million**

Swedish companies make equipment for food processing, but only a few cater exclusively to this industry. One of the largest domestic manufacturers is Alfa-Laval AB, which produces complete dairy systems, heat exchangers, evaporators, homogenizers, and other machinery. Another major firm, Getinge Mekaniska Verkstads AB, manufactures autoclaves, hot-air sterilizers, cleaning machines, and fermenters. Kamas Kvarnmaskiner AB specializes in seed-cleaning plant, flour mills, and grain driers; the Square Company AB makes presses for food patties; and A. Johnson & Company HAB produces stainless steel equipment .

All of the above firms export a significant proportion of their output. Alfa-Laval exports more than 50% of its production and owns manufacturing subsidiaries throughout the world as well.

Germany, Switzerland, and Denmark are Sweden's major foreign sources of food processing equipment. The United Kingdom, the Netherlands, Austria, and the United States also hold significant shares of the import market. The United States is generally regarded in Sweden as the world leader in food processing technology, but European manufacturers derive demonstrable advantages from their lower prices and their proximity to the market. Nevertheless, price is not the most significant factor in purchasing policies of the large firms in need of sophisticated products.

Table 1.—Sweden: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	18.8	19.7	22
Dairy	6.4	6.7	8
Beverages	21.6	22.7	25
Other sectors	82.3	85.1	94
Subtotal	129.1	134.2	149
Food packaging equipment			
Forming, filling, sealing	4.7	4.7	6
Wrapping, packing	14.3	14.3	16
Marking, inspecting	4.7	4.7	6
Container/product/package preparation and handling	7.9	7.9	9
Subtotal	31.6	31.6	37
Total food processing and packaging equipment	160.7	165.8	186

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Swedish trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Analysis of 1973 Swedish import data indicates that German manufacturers held strong shares in sales of cream separators, other dairy machinery, and confectionery machines. Swiss enterprises excelled in sales of machinery for milling grain, presses for wine, and confectionery equipment. Dairy machinery and grain milling devices were among the bestselling Danish products. Austrian manufacturers sold a significant amount of cream separators, while British sales of most importance were in other types of dairy machinery.

Some important third-country firms that are active in the Swedish market include Nibro, a Danish company that supplies spray-driers for preparation of powdered milk; Robert Buhler Company, a Swiss manufacturer of milling equipment and refiners; and Bosch Verpackungemaschinen GmbH of Germany, which sells blenders.

Food packaging equipment.—Approximately 25 Swedish companies manufacture packaging equipment for the food industry. Among the most prominent are PLM and Tetra Pak International AB, which produce complete packaging systems. Automatic Food Supply AB makes automatic transport devices and frozen food storage containers. AB Akerlund & Rausing produces cartoning machinery and various other types of packaging equipment, and Kamas Kvarnmaskiner AB specializes in the manufacture of bag-filling machines, casers, and uncasers.

All the leading Swedish packaging equipment producers are very active in the international market. PLM has manufacturing subsidiaries in Denmark, Holland, and Germany, and Akerlund & Rausing has a plant in Germany. Tetra Pak's subsidiaries are located in many parts of the world, including the United States. These three firms also are the largest importers of food packinging equipment, which is incorporated into systems for reexport.

Germany, Italy, the United Kingdom, and the United States are the major foreign sources of food packaging equipment. The Baatz Company of Germany and SIG Industries of Switzerland are among the leading third-country firms supplying packaging machines to Sweden.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, reveals that American manufacturers will find favorable opportunities for sales of the following types of equipment to the major sectors of the Swedish food processing industry.

Food Processing Equipment

Beverages.—Rectifying plant, screening machines, and pumps.

Meat, poultry, and eggs.—Frozen meat flakers/slicers/cubers, molding machines/presses, beaters (tenderizers), sawing machines, and cooling/freezing equipment.

Dairy.—Ice cream preparation, freezing, cutting, and coating equipment; pasteurizers; and cheesemaking machines.

Food Packaging Equipment

Forming, filling, sealing.—Fillers for liquids, solids, and dry products; and heat sealers.

Wrapping, packaging.—Multipackers, cartoners, and shrink-wrappers and tunnels.

Marking, inspecting.—Checkweighers, coding equipment, metal detection equipment, and labelers.

Container / product / package preparation and handling.—Palletizers, container cleaning/washing/drying systems, and unscramblers.

The Food Processing Industry

The food processing industry in Sweden includes over 1,200 enterprises (see table 2), of which 115 employ 101 to 500 workers and 30 have work forces in excess of 500. The total fixed assets of these firms in 1972 exceeded $1 billion (see table 3).

Increased demand for new types of frozen and convenience foods is the primary factor stimulating growth of the industry. Expansion in frozen foods output is especially rapid, since for the past several years all new housing units have been equipped with substantial freezer units, and all retail food outlets now have large frozen food departments. Development should be particularly marked in the bakery sector, which is just beginning to freeze its products.

Advancements in the packaging of foods will be focused on transport packaging; paper, cardboard, and plastics will be relied upon heavily. Corrugated paper and shrink-film will gain wide usage over the next 5-year period. Glass will continue to be important in the beverage industry, although special plastic containers that deteriorate after a period of time are being developed.

Three major sectors of Sweden's food processing industry are discussed in the following paragraphs. Since half the total growth anticipated by 1978 in consumption of food processing equipment is expected to occur within these sectors, they represent the areas with greatest potential for equipment sales.

Table 2.—Sweden: Number of enterprises in food processing industry sectors by size[1] of enterprise, 1972

Sector	Large	Medium	Small
Meat, poultry, and eggs	6	24	233
Dairy	4	16	157
Fruit and vegetable	3	12	118
Grain	3	19	169
Bakery	3	10	99
Sugar and confectionery	3	8	84
Fats and oils	3	8	89
Beverages	2	7	59
Fish and seafood	3	6	54
Miscellaneous food products	—	5	44

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[1] Large = 500 or more employees.
Medium = 101-499 employees.
Small = 100 or fewer employees.

Source: Data based on *Svensk Industri, Industribranschernas Utveckling, Delrapport Nr 1*, published by SOU (Estade Public Investigations), 1974, and Swedish trade source estimates.

Beverage manufacturing.—The 68 firms involved in making beverages in Sweden produced a total of 1.7 billion liters in 1969 and 1.8 billion liters in 1972. Fixed assets of these enterprises in 1972 amounted to $215 million. Two groups dominate the beverage industry: AB Pripps Bryggerierna, marketing soft drinks under the Pripps label, and Kooperativa Forbundet, selling beer and soft drinks bearing the Varby label. The output of these organizations makes up to 45% of the country's total beverage production. Pripps alone commands 60% of the soft drink market and 25% of total beverage sales. The government-controlled wine and liquor company, AB Vin & Spritcentralen, accounts for another 40% of beverage production.

Although none of the systems employed by beverage manufacturers is particularly new in concept, no plans for large new facilities appear imminent. Pripps and other firms are nevertheless continually replacing equipment and improving production lines. In addition, it is likely that the crushable, biodegradable, plastic beer bottle now being developed will create a need for new machinery.

Meat, poultry, and egg processing.—This sector, with total assets of $190 million, is second largest in the Swedish food processing industry. Output of meat and poultry products totaled 764,000 tons in 1969 and 760,000 tons in 1972.

The two dominant organizations in this sector are Slakteriforbundet and Kooperativa Forbundet. The former sells fresh and processed meats under the Scan label, while the latter's products reach retailers with Foodia AB and Winner brand names. Slakteriforbundet accounts for 85% of all fresh meat and 40% of all processed meats produced in Sweden. The combined production of these firms makes up 70% of Sweden's total. The next largest meat processor is Lars Johnssons Charkuteri, followed by AB Felix and AB Findus. Together these three companies account for approximately 15% of the sector's output.

Table 3.—Sweden: Basic data on food processing industry sectors 1972

Sector	Production (thousands of tons)	Total fixed assets ($ millions)
Meat, poultry, and eggs	760	190
Dairy	2,558	165
Fruit and vegetable	33	60
Grain	596	70
Bakery	375	100
Sugar and confectionery	219	65
Fats and oils	671	80
Beverages	1,755[1]	215
Fish and seafood	49	75
Miscellaneous food products	n.a.	40

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[1] Millions of liters.

Source: *Foretagen*, Swedish Central Bureau of Statistics, 1973.

Investments by meat and poultry processors will be concentrated on improvement of systems now in use; no elaborate new installations are planned. In all probability the two major groups will add new product lines and may establish new plants.

Among management's primary concerns are cost cutting and more efficient production. High-speed lines are being developed, but runs will remain relatively short. Equipment satisfying these requirements will be of particular interest to meat and poultry processors.

Dairy products manufacturing.—Fixed assets of the 177 enterprises comprising the dairy sector totaled $165 million in 1972. Output of milk and dairy products amounted to 2.7 million tons in 1969 and 2.6 million tons in 1972. Mjolkcentralen, a farmers' cooperative, is the major producer, accounting for about 50% of the sector's total output. The three other large groups in this sector, Skanska Mejeri, Nedre Norrlands Produkter, and Norrprodukter, together account for an additional 35%.

Although the very latest methods have been employed by most manufacturers of dairy products and no large-scale development is expected, management is interested in U.S. food technology and is willing to invest in new ideas and methods. The desire to improve systems and a capability to do so make this industry a good prospect for equipment sales.

Trade and Technical Regulations

A general tariff of 8% is levied on food processing and packaging equipment imported into Sweden. Additional information on duty rates and trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

The electrical system utilizes 220 volts, 50 cycles. The norms, based upon those of the International Electrotechnical Commission, are designed for equipment that requires no more than 600 volts, 200 cycles. Special permits are required for higher frequencies. The metric system is standard in Sweden.

Information on the availability of published standards for food processing and packaging equipment in Sweden may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Additional Information

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U.S. Department of Commerce
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Please request: "The Market for Food Processing and Packaging Equipment in Sweden", DIB 74-11-514, August 1974.

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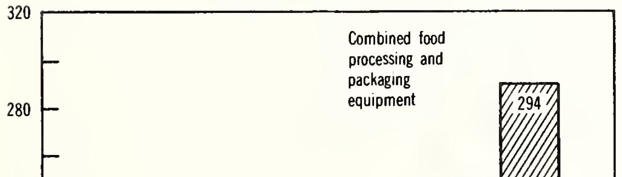
United Kingdom

The market for food processing and packaging equipment in the United Kingdom is expected to show continuing growth through 1978 despite the present general downturn in the British economy. Combined food processing and packaging equipment sales for 1972 totaled $212.4 million.[1] After a period of very rapid expansion due to modernization of food processing facilities in 1973, expenditures leveled off at $246 million in 1974 (see table 1). Trade sources predict that the market will grow at an average rate of 4.5% annually during the next 4 years, reaching $294 million in 1978.

United Kingdom: Food processing and packaging equipment market, 1974 and 1978.

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on British trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Since the *food processing equipment* currently in use is relatively modern and automated, demand is not expected to increase substantially over the next few years. Sales amounted to $152.6 million in 1972 and increased slightly to $155 million in 1974. A modest growth of 2.8% annually is predicted for 1974-78, with the market in the latter year likely to reach about $173 million.

However, the demand for highly sophisticated food processing equipment—increasingly obtained from abroad—is expected to rise markedly. Imports (excluding refrigeration units) totaled $80.4 million in 1974, of which U.S. manufacturers provided almost $10.5 million. Forecasts place 1978 imports at $111.4 million, with American industry selling $13.4 million, or a 12% share of the total.

The market for *food packaging equipment* has expanded rapidly in recent years. From the 1972 level of $59.8 million, sales rose to $90.8 million in 1974 as a result of major modernization programs in the food industry.

An annual growth rate of 7.5% is forecast for sales during the next 4 years as manufacturers automate packaging lines to economize on labor costs. Rising costs of raw materials and petroleum are other factors that encourage greater mechanization of packaging operations and increase demand for sophisticated equipment and automated warehousing systems. The market should total $121 million by 1978.

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[1] All values are shown in U.S. dollars. Local currency data for all years are converted at the following exchange rate: US$1.00=0.42 pounds.

United Kingdom—Economic Indicators
(1973)

Gross national product: $150.5 billion
Total country imports: $33.1 billion
Imports from U.S.: $3.3 billion
Total country exports: $27.4 billion
Exports to U.S.: $3.3 billion
Population: 55.9 million

Packaging equipment imports by the British food industry totaled $50.4 million in 1974 and are projected to exceed $73 million in 1978. U.S.-made products accounted for 15.5%, or $7.8 million, of the 1974 imports. Projections for 1978 place U.S. manufacturers' share at 14%, or $10.3 million.

Competitive Environment

Foreign manufacturers supplied slightly more than 50% of the food processing and packaging equipment sold during 1974 in the United Kingdom. The domestic industry's increasing lack of resources for large-scale research and development has caused a technological lag in locally produced items. As a result, leading U.K. food processing companies are looking to other sources for sophisticated equipment. This trend should continue as American and European suppliers make inroads on the market shares of domestic firms.

Although U.S. equipment generally is no more expensive than European items, price is not always the most important consideration in purchasing decisions. Competition from European procedures is becoming increasingly keen due to their reputations for equipment reliability, well-established sales organizations, and excellent after-sales services.

Ability to handle small production runs is a major factor in sales of processing equipment, and adaptability to diverse product lines and short switchover times are of primary importance in the packaging machinery market.

A profile of U.S. industry's competition from third-country as well as domestic suppliers active in the British market follows:

Third-country competition.—German and Dutch firms are the major foreign competitors to U.S. suppliers in the British market for food processing equipment; German, Italian, and Swiss companies have strong positions in the food packaging equipment market (see table 2 for 1971-73 data on imports of selected categories of equipment from the United States and other countries).

Leading third-country suppliers of processing equipment to the British food industry include the German firms of Rudolph Baader (fish processing equipment), Hermann Bauermeister GmbH (chocolate-making machines), Ortmann & Herbst (brewing equipment), Westfalia Separator A.G. (cream separators), and Anton Steinecker GmbH (brewing apparatus); Stork Amsterdam BV of the Netherlands (a complete line of processing equipment); the Swedish suppliers, Alfa-Laval AB (dairy systems), and Frigoscandia AB (quickfreezing units); the Swiss firms, Buhler Gebrueder AG (chocolate-making units), and Kustner Freres et Cie SA (dairy processing apparatus, especially for production of cheese); and the Danish companies, Aasted Chocolate Machines A/S (confectionery items), Anhydro A/S (spray-driers) and Paasch & Silkeborg A/S (butter churns).

The most important third-country manufacturers of food packaging machinery selling in the United Kingdom include the German suppliers, Enzinger Union Werke AG (bottling machinery), Fr. Hesser Machinenfabrik AG (packaging equipment), and H. Strunck & Co. (bottling systems); E. P. Remy et Cie (filling and weighing equipment for liquids and powders) of France; Tetra Pak AB (packaging machines) of Sweden; and SIG Schweiz Industrie-Gesellschaft (wrapping devices) of Switzerland.

Other firms selling significant quantities of equipment in the United Kingdom are Serac of France, Multivac Sepp Haggenmueller of Germany, Perdjik & Co. NV of the Netherlands, and Sprinter System AB, a Swedish firm. Homac Hoeller GmbH and Hoeflinger & Karg of the Robert Bosch group also are active in this market.

Domestic manufacture.—Labor problems, a shortage of components, rising raw materials prices,

Table 1.—United Kingdom: The market for food processing and packaging equipment, 1973, 1974, and 1978

(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	14.9	15.1	18
Dairy	14.6	14.4	17
Bakery	17.8	17.0	19
Sugar and confectionery	19.2	19.0	21
Beverages	56.4	51.6	58
Other sectors	38.4	37.9	40
Subtotal	161.3	155.0	173
Food packaging equipment			
Forming, filling, sealing	45.8	47.7	64
Wrapping, packing	21.8	22.7	30
Marking, inspecting	13.1	13.6	18
Container/product/package preparation and handling	6.6	6.8	9
Subtotal	87.3	90.8	121
Total food processing and packaging equipment	248.6	245.8	294

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on British trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—United Kingdom: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-73

(in thousands of U.S. dollars)

	1971	1972	1973
Food Processing Equipment			
Dairy machinery, other than cream separators			
United States	n.a.	293	614
Denmark	636	2,095	2,878
The Netherlands	n.a.	5,122	8,952
Sweden	936	1,090	1,457
Others	n.a.	1,436	2,510
Total	2,945	5,122	8,952
Food processing machinery, other than dairy, grain milling, and winemaking equipment			
United States	3,533	4,236	5,314
Germany	5,926	7,886	11,400
The Netherlands	1,334	1,654	3,384
Denmark	1,728	2,249	2,652
Others	5,743	7,985	10,917
Total	18,264	24,010	33,667
Refrigerating equipment [1]			
United States	6,650	5,434	6,240
Denmark	13,949	18,384	25,793
Italy	5,971	10,461	22,337
Sweden	7,649	12,132	14,047
Others	25,159	36,948	49,505
Total	59,378	83,359	117,922
Pumps for liquids [1]			
United States	11,842	11,498	17,292
Germany	8,114	9,372	16,747
Sweden	7,488	6,737	10,625
The Netherlands	2,901	4,173	6,720
Others	15,044	20,972	28,711
Total	45,389	52,752	80,095
Centrifuges, filtering, and purifying machinery [1]			
United States	6,545	8,398	9,982
Germany	6,019	6,281	8,167
The Netherlands	1,442	1,680	4,192
Sweden	3,247	3,418	3,900
Others	6,281	7,221	9,075
Total	23,534	26,998	35,316
Packaging Equipment [2]			
Container filling machinery, packaging machinery, etc.			
United States	7,656	9,168	12,485
Germany	10,584	15,413	25,238
Italy	7,054	6,830	11,630
Switzerland	6,223	6,406	7,632
Others	9,919	11,901	17,273
Total	41,436	49,718	74,258

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[1] Since United Kingdom official trade statistics do not differentiate between processing equipment for food and non-food uses in this category, both types of equipment are included in these figures.

[2] Since United Kingdom official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by British trade sources to account for 40% of total packaging equipment imports.

Source: *Overseas Trade Statistics of the United Kingdom*, 1971, 1972, and 1973, Department of Trade and Industry.

and increased fuel costs have adversely affected British production of food processing and packaging equipment. From their former position of leadership in local sales, the 350 firms in the British industry have experienced decreasing market shares in recent years. This loss of dominance in the domestic market has led them to depend increasingly on exports in an effort to maintain output levels. Approximately 40% of total 1973 production was exported, mainly to European Economic Community (EEC) members.

In real terms, the production of machinery for food processing and packaging has shown almost no growth since 1959 and is unlikely to expand at more than 4% annually during the 1974-78 period. Low British labor costs may lead to an increase in the number of foreign firms establishing subsidiaries and manufacturing affiliates in the United Kingdom.

In spite of an underlying preference among U.K. end-users to "buy British," other considerations take precedence in sales. The tariff structure, which levies comparatively low duties on equipment imports from the United States and EEC members and permits free trade with members of the European Free Trade Association (EFTA), does not protect the domestic producer from foreign competition.

Approximately 80% to 85% of British food processing and packaging equipment manufacturers are small and employ fewer than 100 people. Of the 37 major firms, 14 are subsidiaries of American or Swedish organizations.

Among the leading wholly British-owned producers of food processing equipment are A.P.V. Co. Ltd. and Bowater Corporation Ltd. (manufacturers of equipment for breweries and dairies); Dawson & Barfos Ltd. (dairy machinery and beverage apparatus); Douglas-Rownson Ltd., The Lightfoot Refrigeration Co. Ltd., Prestcold Ltd., and Hall Thermotank International Ltd. (refrigeration units); Mather & Platt Ltd., Simon Henry Ltd., and Burnett & Rolfe Ltd. (general lines of equipment); Baker Perkins (Holdings) Ltd. and Simon-Vicars Ltd.

Table 3.—United Kingdom: Number of enterprises in food processing industry sectors by size[1] of enterprise, 1970

	Large	Medium	Small
Meat, poultry, and eggs	30	112	732
Dairy	16	102	493
Fruit and vegetable	31	61	225
Grain	8	16	292
Bakery	45	123	673
Sugar and confectionery	29	47	292
Fats and oils	5	16	130
Beverages	45	128	632
Fish and seafood	6	10	80
Miscellaneous food products	14	40	234

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[1] Large = 500 or more employees.
Medium = 100-499 employees.
Small = 99 or fewer employees.

Source: Data based on "Report on the Census of Production, 1970." Department of Trade and Industry, and British trade source estimates.

(confectionery and bakery machinery); Gardners of Gloucester Ltd. (sifters, mixers, and blending devices); and Cocksedge & Co. Ltd. (sugar beet refining units).

Subsidiaries of American firms, with the names of their parent companies shown in parentheses, include AMF International Ltd. (AMF Inc.), a maker of bakery equipment; Air Products Ltd. (Air Products & Chemicals Inc.), cryogenic units; Henry Balfour & Co. Ltd. (Sybron Corp.), brewery equipment; Barry-Wehmiller Machinery Co. Ltd. (Barry-Wehmiller Co. of the United States and Stone-Platt Industries Ltd. of the United Kingdom), beverage and food processing devices; and DCA Industries Ltd. (DCA Food Industries Inc.), bakery and frozen food apparatus. Others are FMC Corporation (U.K.) Ltd. (FMC Corp.), food processing systems; Hobart Manufacturing Co. Ltd. (Hobart manufacturing Co.), food processing machinery; Mono Pumps Ltd. (American Brands Inc.), pumping equipment; and Worthington Simpson Ltd (Studebaker-Worthington International Inc. of the United States and Weir Group Ltd. of the United Kingdom), pumps and heat exchange equipment. Manufacturing subsidiaries of Swedish firms include Alfa-Laval Co. Ltd. (Alfa-Laval AB), which makes general food processing and dairy equipment, and Frigoscandia Ltd. (Malmos Roderi AB), a producer of refrigeration units.

Among local producers of food packaging equipment are W. T. Avery Ltd. (weighing, testing, and counting devices); Baker Perkins (wrapping and packaging machinery); Driver (Southall) Ltd. (automatic weighers and fillers, packaging units); Gardners of Gloucester Ltd., W. & C. Pantin Ltd., and Cocksedge & Co. Ltd. (handling apparatus); and Lerner Machine Co. Ltd., Mather & Platt Ltd., The Metal Box Ltd., Rose Forgrove Ltd., and Autowrappers (Norwich) Ltd.

Subsidiaries of U.S. companies producing packaging apparatus are Hobart Manufacturing Co. Ltd. (Hobart Manufacturing Co.), which makes container-washing equipment; and George J. Meyer Ltd. (A.T.O. Inc.), a maker of bottling and packaging machinery. Arenco-Alite Co. Ltd. (a subsidiary of Swedish Match AB), manufactures rotary filling machines and packaging machinery.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, suggests that American manufacturers will find favorable opportunities for sales of the following types of equipment to the leading sectors of the British food processing industry.

Food Processing Equipment

Beverages.—Aseptic systems for processing and bulk storage of products from single strength to concentrates, carbonating apparatus, concentration control equipment, condensers/evaporators, filtering machinery, mashing vats with agitators and heating elements, and presses.

Sugar and confectionery.—Carbonation vats, cocoa bean husking devices, comminuting equipment, continuous mixing/whipping/chilling units, defecation vessels, dipping machines, filter presses, roller mills, and sulfiting vessels, including thermal equipment.

Bakery.—Biscuit-filling devices, biscuit/wafer/cracker machines, breadmaking equipment, dough-mixing/kneading/dividing/rounding/proofing systems, enrobing gear, and ovens.

Meat, poultry, and eggs.—Cooling/freezing equipment; bacon-forming, boning, dehairing, sausage-stuffing, and sawing machines; bone-choppers; poultry defeathering and eviscerating equipment and rendering and slaughtering equipment.

Dairy.—Centrifugal milk clarifiers, cheesemaking machines, heat-exchange systems, homogenizers, and spray-driers for preparation of powdered milk.

Food Packaging Equipment

Forming, filling, sealing.—Can-making machinery; cappers, crimpers, hooders; carton erecting and sealing equipment; fillers for dry, liquid, and viscous products; vacuum form/fill/seal systems; and vacuum thermoformers.

Wrapping, packing.—Cartoners, direct; overwrapping, and outer-wrapping machinery; multipackers; and shrink-wrappers and tunnels.

Marking, inspecting.—Code devices, checkweighers, labelers, level-checking machinery, and metal detection equipment.

Container/product/package preparation and

Table 4.—United Kingdom: Basic data on food processing industry sectors, 1972

(values in millions of U.S. dollars)

Sector	Sales by manufacturing establishments	Production	Production (quantity)	Net capital investment[1]
Meat, poultry, and eggs	3,100	1,875	2,937 thousand tons	58.3
Dairy	3,195	2,637	1,629 million gallons[2] 696 thousand tons[3]	51.4
Fruit and vegetable	1,574	1,248	1,323 thousand tons	34.1
Grain	966	955	6,705 thousand tons	24.7
Bakery	1,806	1,839	3,599 thousand tons	72.7
Sugar and confectionery	1,752	1,784	2,227 thousand tons	60.5
Fats and oils	895	748	1,941 thousand tons	22.3
Beverages	4,782	5,101	1,826 million gallons	221.0
Fish and seafood	458	297	461 thousand tons	12.0
Miscellaneous food products	1,197	1,076	n.a.	28.8

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[1] Includes depreciation on land and buildings.

[2] Milk.

[3] Other dairy products.

Source: Data based on "Annual Abstract of Statistics, 1973," Central Statistical Office; "Report on the Census of Production, Provisional Results 1972," Department of Trade and Industry; and British trade source estimates.

handling.—Accumulators/collators, automated warehousing systems, container cleaning/washing/drying lines, palletizers, and unloaders.

Other items with good sales potential for U.S. manufacturers include continuous blancher/cooker/cooler/sterilizer systems; shredding, grinding, and chopping machines; freezing equipment; and juice extractors. In addition, there is a promising market for peelers, pulpers, pumps, and washing devices.

The Food Processing Industry

Food processing enterprises in the United Kingdom in 1970 numbered 4,667, of which 229 employed 500 or more persons (see table 3). The net capital investment of all food processors in 1972 exceeded $585 million. Sales totaled $19.7 billion, and production amounted to $17.6 billion (see table 4). The industry is relatively modern and efficient. Consolidation has taken place among small companies in recent years, and trends point to increasing amalgamation of small firms through mergers or acquisitions. Several multinational enterprises now dominate the industry.

The food processing industry has been one of the hardest hit by the economic problems of the United Kingdom. The cost of fresh foods purchased by the industry increased by an extraordinary 30% in 1973 alone. This added expense, coupled with increasing labor and fuel costs, has led to substantially reduced profit margins, and expansion programs have consequently been cut back. Companies in the U.K. food processing industry are expected to postpone substantial investments in plant and machinery during 1975-76, and demand for new equipment probably will stay at a low level through 1978.

The past few years have seen increasing government influence in the food processing industry. Production of several food items, including bread, cheese, butter, milk, flour, and tea, are now subsidized. In addition, the Department of Industry has been considering nationalization of a number of leading food processing firms. These public ownership plans were the subject of a "White Paper on Industry," published in August 1974. The paper proposed formation of a National Enterprise Board with powers of acquisition and the right to start new ventures. Also suggested was a system of 3-year planning agreements between Government and major companies.

Frozen food production is an important area of industry growth. Retail expenditures on frozen products in Britain rose steadily from $144 million in 1962 to $429.6 million in 1972, reflecting an average annual growth rate of about 11.5%. The proportion of homes containing refrigerators rose from 30% to 71% during the same period. Fruit and vegetable processors are the most important users of quick-freezing equipment, followed by fish and seafood processors.

Change in the use of packaging materials (see table 5) is likely to focus on recycling, as manufacturers attempt to relieve the desperate paper shortage in Britain. Several firms also are looking into the possibility of recycling metal containers, and two firms are expected to form a joint company to reuse plastics and other materials. Additional changes may result from the necessity for British exports to the EEC to conform with the packaging regulations of that organization.

Processors have expressed interest in flexible and semi-rigid sterilizable packs. These containers, which consist of a foil-laminated pack in a polystyrene or

Table 5.—United Kingdom: Consumption of selected packaging materials by the food processing industry, 1968 and 1972

Packaging material	Units	1968	1972
Fiberboard cartons	million square meters	820	965
Paperboard cartons ...	thousand tons	260	285
Plastics	thousand tons	120	230
Glass containers	million units	4,520	5,110[1]
Tinplate cans	million units	n.a.	7,650
Aluminum foil	thousand tons	21	24

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[1] 1971 data.

Source: Data based on *Statistical Review of the Packaging Industry, 1968-72*, published by the Research Association for the Paper & Board, Printing and Packaging Industries, United Kingdom, and British trade source estimates.

polyvinyl chloride outer wrap, are challenging the can and bottle as packaging materials for high-quality products because they require a much shorter heat-processing time. The technology of packaging in sterilizable laminates is expected to move forward rapidly over the next few years. A Merolite film tube, which contains a pouch made of a seamless, high-strength composite tubular polyester film wrapped in a strong paper sleeve, also has been introduced in the beverage market. This item, although unsuccessful as a container for beer, is being used for soft drinks.

The five most important sectors of the British food processing industry are discussed below. The selection, based on an analysis of past expenditures for plant and machinery, identifies areas promising good sales potential for U.S. manufacturers.

Beverage manufacturing.—The making and bottling of beverages is the largest sector in the British food processing industry. Approximately 45 large companies (those with over 500 employees) and 760 smaller firms together had capital investments totaling $221 million in 1972. Total production, which amounted to 1.7 billion gallons (gal) in 1970 and increased to 1.8 billion gal in 1972, reflected growth at an average rate of 3% a year. Of 1972 output, spirits comprised 181 million gal; beer, 1,271 million gal; wine, 12.2 million gal; concentrated soft drinks, 71.0 million gal; and unconcentrated soft drinks, 291 million gal. Large companies accounted for some 60% of the beer and soft drink production.

Introduction of a value-added tax on beverages to replace the old excise system resulted from entrance of the United Kingdom into the EEC. This change reduced the price of alcoholic beverages and gave a tremendous boost to sales. Spirits consumption rose by 25% in 1973, while wine sales grew 26%, and beer consumption increased nearly 5%.

A few large companies dominate the alcoholic beverage industry. The Scotch whisky industry, accounting for more than half of all spirits sold in Britain, is dominated by the Distillers Company, marketing under the brand names of Johnnie Walker, Haig, Dewars, White Horse, and Vat 69.

Six companies predominate in beer sales. Allied Breweries sells its products under the trade names of Ind Coope, Skol, and Ansells. Bass Charrington's products are marketed as Bass, Worthington, Carling, and M&B. Truman and Watneys are produced by Grand Metropolitan. Courage is made by the Imperial Group, and McEwans and Newcastle Brown are made by Scottish and Newcastle Breweries. Heineken and Whitbread are produced at the Whitbread breweries.

The soft drink industry is still quite fragmented despite a trend toward consolidation. The number of manufacturers has declined from approximately 800 a decade ago to 350 today, and that number is likely to decrease significantly in the near future. The major manufacturers of citrus fruit drinks ("squashes") are Cadbury Schweppes, using the Sunfresh, Suncrush, and Kia Ora trade names; Batchelor, selling the Treetop brand; Beecham, with the Quosh label; and Reckitt and Colman, whose products reach stores with the trade name Robinsons. The leader in the "mixers" market is Schweppes; Canada Dry is in second place. Other major carbonated beverage producers include Whites, Tizer, and Corona. Coca-Cola, distributed by Beecham and Watney Mann, accounts for over 50% of the cola market and Pepsi-Cola, distributed by Schweppes, holds an estimated 23%.

Expansion in the beverage industry centers around the plans of Scotch whisky producers to build new distilleries and blending and bottling plants. This investment program reflects a growing world demand for Scotch. A sudden spurt in sales of malts should encourage brewers to invest in the type of expensive storage and chilling plant needed for the lager bottom fermentation process. Some expansion in winemaking is possible, owing to a 48% increase in consumption between 1969 and 1972, but the British climate prevents its development into a major industry.

Future growth within the alcoholic beverage industry probably will include formation of subsidiary organizations in Europe. For example, Allied Breweries recently expanded its operations into the Netherlands, and Watney Mann acquired a 76% interest in Stern Brauerei Carl Funke, one of the leading German brewing groups.

Several new advances may lead to modernization of beverage manufacturing facilities. Use of Clean-in-Place (CIP) machinery, which started in the dairy industry, has extended into brewing and soft drink processing, and sales associated with its introduction should expand considerably. A glass shortage is leading to increased marketing of soft drinks and beer in cans. Several firms have installed new high-speed lines for the production of these containers. The lack of glass also is expected to force a number of small soft drink processors out of business, increasing the hold of large producers on the market. This development should contribute to a greater demand for sophisticated equipment, particularly for high-speed bottle- filling and washing lines, and canning lines with capacities of 1,100 cans per minute.

The Watney Mann Ltd. brewery at Mortlake contains equipment typical of that used in many large facilities. Of the major components, which were installed in 1973-1974, Buhler supplied the malt-handling devices, Avery the weighers, and Steinecker the brewhouse equipment. Alfa-Laval manufactured the plate heat exchangers and centrifuges; A.P.V., the fermenters; Manor Engineering, the filter presses; and Stainless Steel Vessels, the yeast tanks. H.T.I. provided the refrigeration units. Carbon dioxide reclamation processes depended on Witteman equipment, and steam-raising apparatus was manufactured by Babcock & Wilcox. The transfer capacities of the plant are 320 and 150 barrels (bbl) per hour on two lines. Kegging speed is 80 bbl per hour on three lines, and 36,000 half-pint bottles can be processed in an hour.

Sugar refining and confectionery manufacturing.—This sector, the second largest in the British food processing industry, produced 1.84 million tons of sugar and other products (excluding syrup and molasses) in 1970. The output rose to 2.15 million tons by 1972. Net capital expenditures grew from $46.2 million in 1970 to $60.5 million in 1972.

The 29 companies with more than 500 employees account for 70% of the sales in this sector. Major sugar refineries are Tate & Lyle, Manbre & Garton, and the British Sugar Corporation. Among the most important cocoa, chocolate, and confectionery producers are Cadbury Schweppes, Rowntree Mackintosh, and Mars.

Refiners have been faced with spiraling world market sugar prices, and the resulting uncertainty has postponed investment plans. The doubtful future of the cane sugar market is another factor making producers reluctant to embark on large capital expenditure programs. However, since beet sugar is the main saccharine commodity purchased by EEC members, there is a strong likelihood that its production will expand over the next 5 years.

Raw cocoa prices also have climbed to unprecedented heights. Coupled with the new value-added tax of 10% on some confectionery items, this increase has led British confectionery manufacturers to cut back on their investment programs and to concentrate on overseas markets.

The sugar refining sector of the industry has seen little change in methods over the last 10 years. Except for filtration, evaporation, and packaging apparatus, a significant percentage of the equipment in use was installed after World War II. Much of it is semiautomatic, and packaging speeds are relatively slow. The chocolate and sugar confectionery products sector, on the other hand, is relatively modern and has automated production facilities, except for packaging operations, which are still labor-intensive.

Most future investment by the sugar industry will be in centrifugal machinery and filtration and evaporation equipment. Some companies are phasing in faster, more automated packaging machinery with accurate weighing apparatus. Chocolate and sugar confectionery producers constantly look for higher speed machinery. Since most of the present packaging systems in use are semiautomatic, companies are planning heavy capital investment in automated lines. Extensive research programs are investigating better use of materials and possible substitutes for expensive ingredients such as cocoa, sugar, and butter; future equipment requirements may depend on the outcome of these efforts.

The Mars Ltd. installation at Slough has equipment which, like that of many other confectionery manufacturing establishments in Britain, was installed during the last 15 years. Worthington Simpson built the water pumps, and Baker Perkins made the heat exchangers, cooling tunnels, and rollers. Cherry Burrell produced the rotators; Hoball Engineering, the stainless steel tanks; and Gardners of Gloucester, the mixers. Sandvik, Habesit, and Scandura made the conveyers. The chocolate-making equipment came from Buhler, conches from Petzholdt. Rose Forgrove and SIG fabricated the flow-pack machines, and Sapal and Rose Forgrove built the DF machines. The average speed of the processing line is 100 to 120 flow-packs per minute.

Bakery products manufacturing.—The value of baked goods produced in the United Kingdom rose from $1.6 billion in 1970 to $1.8 billion in 1972, reflecting average annual growth of 6%. Of the 1972 total, $1.3 billion represented bread and cake production, and $500 million was derived from the manufacture of biscuits. In that same year, output totaled 3.6 million tons. The net capital expenditures of the companies in this industry amounted to $75.1 million in 1970 and $72.7 million in 1972.

Three groups control approximately 70% of the bread sales. They are Ranks Hovis McDougall, with 25% of the market; Associated British Foods, with 26%; and Spillers-French, with 20%. These groups control all levels of production from flour milling through baking and delivery to retail outlets. The two leading biscuit manufacturers are United Biscuit, which accounts for nearly 50% of sales and uses the brand names McVitie, Crawford, Macfarlane Lang, Meredith and Drew, Carrs, and Kemps; and Associated Biscuit Manufacturers, which markets products with the Huntley and Palmers, Jacobs, and Peek Freans trade names.

Trends in the bakery sector point to a reduction in profits due to government price control measures, inflation, and raw material problems. Reductions in capital expenditureas are likely, particularly in biscuit manufacturing, because a 10% value-added tax has been placed on chocolate cookies. Subsidies, which have been extended only to bread manufacturers, could boost bread sales at the expense of biscuits and cakes. Continued expansion into related fields such as convenience catering can be expected. There should be considerable consolidation through takeover of many small bakeries by large groups and mergers among the groups.

The methods of processing and packaging presently employed in this sector are not likely to change significantly in the near future. Most biscuits are roll wrapped or flow packed. Only expensive varieties are marketed in boxes and cartons, and loose packaging in bags has not been well accepted by the customers.

The equipment in United Biscuit's Harlesden plant was manufactured by a variety of domestic and foreign companies. The computer control system was supplied by Ferranti. Baker Perkins, Henry Simon, and Douglas-Rownson produced the bulk raw material handling equipment. Mixers, ovens, and cooling devices, came from Baker Perkins and Simon Vicars. Dough-forming equipment was supplied by the latter two firms and by Perdjik, Oka, and Oaks. Rose Forgrove and SIG manufactured the roll-wrapping units (speeds of 60-80 packs per minute) and the flow-packing devices (speeds of 80 packs per minute). Individual wrapping machines came from Sapal. Woodman, Wrights, and Rovema supplied double-head bagging equipment with speeds of 60-80 units per minute. Rose Forgrove was the source of the overwrapping machines, and Kliklok and Sprinter built the box-forming apparatus. A variety of suppliers produced the shrink-wrapping equipment.

Meat, poultry, and egg processing.—Output of U.K. meat and poultry processors rose just under 2% annually between 1970 and 1972, increasing from 2.74 million tons to 2.84 million tons, excluding eggs. Capital expenditures of all sector producers rose during the same period from $42.3 million to $58.3 million.

Although individual butchers still retain a great deal of importance in the processed-meat market, their share is declining as supermarkets become increasingly important outlets for meat products. At present, approximately 40% of the canned meats, poultry, and bacon sales are controlled by large firms. Major U.K. producers of canned cold meats include Fitch Lovell, the producer of Spam; Brooke Bond, which makes the Fray Bentos brand; and Unilever, whose products are sold with the Unox trade name. Makers of other canned meat items are Spillers and Brooke Bond. The Walls brand, made by Unilever, is the leader in the branded sausage market, accounting for an estimated 50% of the sales. Other sausage producers include Scot Bowyers of Unigate, FMC, and J. Lyons. Unigate and Pork Farms are leaders in the meat pie market. Poultry processors include Imperial, Associated Fisheries, Union International, and Fitch Lovell. The most important companies in bacon curing are Unilever and FMC.

Considerable development is expected in this sector. Distribution patterns and packaging techniques are gradually changing as the number of independent butchers decreases by about 1,000 a year. The amount of meat that is vacuum packed at the slaughter stage is increasing steadily. A number of companies have plans to predivide carcass meat into units to save on transportation costs. Developments also are expected in processing techniques, since some operations still are relatively unsophisticated and only a small proportion of the equipment in use is fully automatic.

Improvements in refrigerating machinery and automatic brine injection devices are anticipated. Poultry processors also are investing in new equipment to meet the EEC standards for hygiene. Greater emphasis is being placed on maximum utilization of the animal, so that extraction apparatus will be in increasing demand. Of considerable interest to members of the industry is machinery for precision cutting and shaping of products and for making use of the bones. Companies also are expected to invest in more automatic piemaking equipment and sausage machinery, as well as pumps and packaging apparatus for bacon manufacture. Automated packaging equipment also should be in demand as new product lines of convenience foods are offered by the processed meat industry.

T. Wall & Son controls 50% of the branded sausage market and 30% to 35% of the vacuum-packed bacon sales. Its facility in Acton is characteristic of installations run by many large meat processors. The slaughtering equipment is mainly of American origin. Conveyors and stainless steel tanks are products of local fabrication, and the molders are of European origin. Refrigeration units come from Lightfoot, BOC, and H.T.I. Slitting devices and curing apparatus were made by Anco. Wetter and Strommen choppers are used; Wetter also supplied sausage casing units. Continuous fillers come from Karl Schnell, spiral driers and cooling equipment from Greer. Packing equipment was supplied by Multivac, Cryovac, Mahaffy & Harder, and Swissvac. Packing speeds for pies and sausages are 60 units per minute, while bacon packing takes place at the rate of 70 units per minute.

Dairy products manufacturing.—Production of milk was set at 1.64 billion gal in 1970 and 1.63 billion gal in 1972: output of other dairy products totaled 578,000 in 1970 and 696,000 tons in 1972. The net capital expenditures of the sector rose during the same period from $44.3 million to $51.4 million.

Leading producers of dairy goods and milk are Express Dairy, owned by Grand Metropolitan, Unigate, and the Milk Marketing Board. These and 13 other large companies control some 30% of the market. Although a considerable number of small dairies still function, the tendency is toward concentration of production in large centers. The short-term outlook for the sector is uncertain due to concern about the effects of the Common Agricultural Policy of the EEC on British dairy farming. Government subsidies are stimulating production of fluid milk for direct consumption but decreasing the amount available for cheese and butter production.

Most of the milk-handling equipment utilized in the United Kingdom is fully automatic, with the exceptions of CIP machinery and warehouse and coldroom aparatus. Most large dairies hope to update equipment of this type in the next few years. Machinery used for making butter and powdered milk is fairly modern, but cheese processing methods are still small-scale and labor-intensive.

The 1975-78 period will see considerable investment in new packaging equipment as plastic milk containers gradually replace the scarce glass bottles now used for daily doorstep delivery. For other equipment, management is looking for improvements in safety and efficiency in addition to reduction in labor requirements. There also should be an increase in demand for high-capacity equipment.

The Unigate company, which controls 30% of the milk-handling market, processes 120,000 gal of milk a day at its White City dairy in London. Equipment utilized in a typical processing line includes broilers from Thompson Cochran and refrigeration units from York and UDEC. A.P.V. supplied the pasteurization equipment, the CIP apparatus, and the stainless steel tanks. UDEC and Dawson made the packaging apparatus for filling glass bottles; Tetra Pak, Pure-Pak, and Blocpak, the equipment for paper cartons. The machinery for the plastic containers came from Rommelag and Sidel.

Trade and Technical Regulations

British import tariff rates vary from 5.7% to 7.5% for U.S.-made food processing and packaging equipment. The original EEC members enjoy reduced duties ranging from 3.0% to 3.7%, but by July 1977 these charges will be completely abolished. Imports from EFTA members already are exempt from duty.

Further information on duty rates and trade regulations applicable to imports of food processing and packaging equipment into the United Kingdom may be obtained from the Office of International Marketing, BIC/DIBA U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

There are no special technical standards or labeling requrements to which imported equipment must conform by law, or to which conformity is commercially desirable. However, safety regulations are stringent in the United Kingdom, and imported apparatus invariably must be modified by the purchaser to meet local requirements. The electrical power supply is 220/240 volts. The system of weights and measures based on the imperial unit was completely abolished in January 1975 when the metric system became the standard.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on the United Kingdom to supplement this report is available on a continuing basis from:

Country Marketing Manager—United Kingdom
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-3713

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in the United Kingdom," DIB 74-12-535, September 1974.

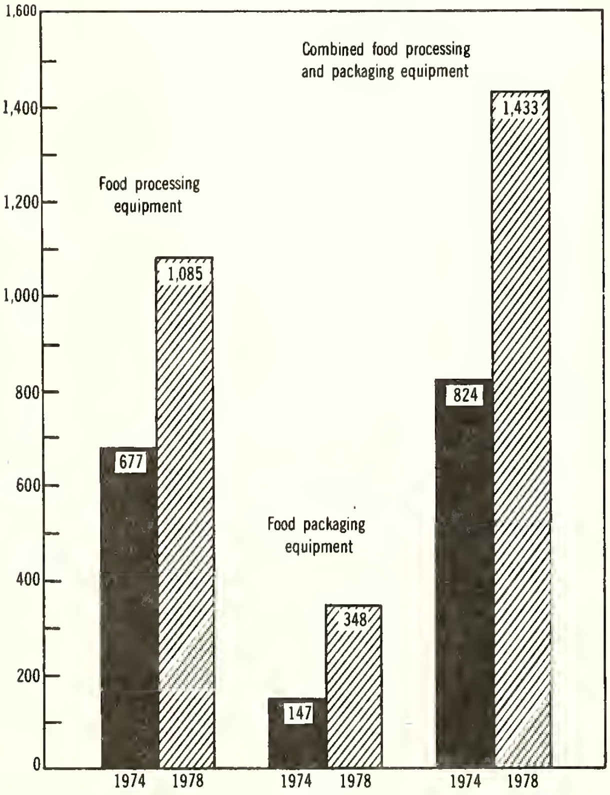
The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food Processing and Packaging Equipment—the United Kngdom," which identifies major prospective customers, potential agents and distributors, trade publications, and trade associations.

Union of Soviet Socialist Republics

Under the increasingly consumer-oriented economic policies of the Union of Soviet Socialist Republics (U.S.S.R.), the Soviet market for food processing and packaging equipment is forecast to attain a value of $1.4 billion [1] in 1978. Plans for increases in the volume, quality, and variety of foodstuffs to be produced call for a 14.8% average annual growth rate in equipment purchases over the 1974-78 period, based on a 1974 market of $824 million (see table 1). During the 1972-74 period, when the higher priority assigned to food processing and packaging initially affected the market, purchases rose almost 40%.

U.S.S.R.: Food processing and packaging equipment market, 1974 and 1978.

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Soviet trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

The current Soviet Five Year Plan (1971-1975) allocates $13.4 billion to expand and modernize food processing facilities—over 50% more than the sum provided under the preceding plan. High levels of expenditures for completing current projects and sustaining future development objectives are also expected during the 1975-78 period. The growing manpower shortage in the Soviet Union should help to speed the adoption of advanced technology as a means of improving productivity.

Purchases of *food processing equipment*, increasing at an average annual rate of 12.5% over their 1974 level of $677 million, are likely to approach $1.1 billion in 1978. In 1972 they amounted to $500 million. The projected growth stems from widespread equipment shortages and requirements for additional plant capacity to accommodate anticipated increases in agricultural output. There is also new emphasis on the production of more processed, canned, and packaged foodstuffs, most of which previously were considered luxury items.

The enormous increase in demand for food processing equipment, combined with the trend toward purchases of sophisticated machinery, should boost imports from $161 million in 1974 to $389 million in 1978. The projected average annual rate of import growth for the 4-year period is 25%, or double the total market growth rate.

The U.S. share of the Soviet import market for this equipment is predicted to expand during the

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1.00=R 0.82 (1971 and 1972), R 0.74 (1973 and subsequent years).

U.S.S.R.—Economic Indicators
(1973)

Gross national product:	**$615 billion**
Total country imports:	**$20.8 billion**
Imports from U.S.:	**$1.37 billion**
Total country exports:	**$21.2 billion**
Exports to U.S.:	**$184 million**
Population:	**249 million**

1974-78 period from 3 to 5%—in absolute terms, a fourfold increase from $4.8 million in 1974 to almost $20 million in 1978. A major factor favoring U.S. sale is the suitability of large-capacity, American-made machinery for use in the large, centralized plants currently being built in the Soviet Union. With U.S. equipment and processing systems being exported to the U.S.S.R. by European subsidiaries and licensees, American technology is becoming better known there. Additionally, a number of leading U.S. firms such as Coca-Cola, Pepsi-Cola, Gerber, FMC, and Norton Simon have begun to do business with the Soviet Union.

The growth of the *food packaging equipment* market should be particularly rapid in view of planned large-volume increases in the production of beer and soft drinks, plus a substantial expansion of self-service retailing. Trade sources indicate that the market will grow from $147 million in 1974 to $348 million in 1978, representing an average annual increase of 24% Total purchases in 1972 amounted to only $90 million.

Because little modern packaging machinery is produced domestically, imports are significant. Hence the import level is expected to double from $80 million to $160 million over the 1974-78 period, with the U.S. share expanding from 5% (about $4 million) in 1974 to 10% (approximately $16 million) in 1978. American Can, Continental Can, and the Stolle Corporation are among the U.S. firms currently negotiating contracts with the Soviet Union.

Competitive Environment

Domestic manufacturers in the Soviet Union supplied approximately three-fourths of the food processing equipment but less than one-half of the food packaging machinery purchased in 1974. The outlook for 1978 is that the growing demand for sophisticated processing equipment will increase dependence upon imports, and that foreign companies' share of the market will rise to about 35%. The need for imported food packaging equipment should remain strong, although the market share held by foreign suppliers could decline slightly between 1974 and 1978 as domestic equipment manufacturers react to the surge in demand.

In the controlled Soviet market environment, suppliers from noncommunist countries compete chiefly with each other rather than with domestic producers or those of communist countries in the Council for Mutual Economic Assistance (CEMA). Imports from free-enterprise countries are usually restricted to items not produced in the Soviet Union or CEMA countries, those in short supply, or those offering essential quality advantages.

Foreign trade is a state monopoly administered by the U.S.S.R. Ministry of Foreign Trade. The Ministry supervises and controls the activities of approximately 60 All-Union Foreign Trade Organizations (FTO's), each of which is responsible for the export and/or import of a particular group of commodities or services. The FTO's conclude contracts on behalf of their internal customers—primarily industrial ministries and enterprises—on a commission basis and are legally independent economic organizations. V/O Technopromimport is the FTO responsible for importing food processing and packaging equipment.

Although the principal criteria affecting equipment selection are price and performance, such factors as service guarantees and financial terms can determine the choice of the item when other differences are slight. Soviet authorities seldom enter into contracts specifying high interest rates or sliding price stipulations.

Trade sources stress the importance of personal contact with purchasing officials in making sales. Additional promotional techniques considered use-

Table 1.—U.S.S.R.: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Meat, poultry, and eggs	174	194	348
Dairy	181	201	348
Fruit and vegetable	34	40	74
Sugar and confectionery	47	54	87
Beverages	80	94	161
Other sectors	103	94	67
Subtotal	619	677	1,085
Food packaging equipment			
Forming, filling, sealing	95	117	250
Wrapping, packing	12	16	42
Marking, inspecting	7	7	28
Container/product/packaging preparation and handling..	7	7	28
Subtotal	121	147	348
Total food processing and packaging equipment	740	824	1,433

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Soviet trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

ful include participation in Soviet trade exhibits, advertising and, when possible, placing reprints of articles on new processes in Soviet trade journals, conducting and participating in symposia, and distributing catalogs. Catalogs may be sent to the State Public Scientific-Technical Library, Division of Industrial Catalogs, Moscow, Ploshchad' Nogina 2/5, U.S.S.R., for dissemination to end-users.

A review of the local food processing and packaging equipment industry and of the third-country suppliers active in the Soviet market follows.

Domestic manufacture.—The Soviet Union produces large volumes of low-capacity, standard equipment but little high-capacity or other advanced technology equipment for food processing and packaging. During 1971-73, domestic manufacturers could furnish only about 700 of 1,300 types of equipment requested by end-users, and production difficulties caused delivery delays that slowed the openings of new plants. Although technology and manufacturing capacity are improving, serious bottlenecks in equipment delivery remain.

An estimated 150 factories manufacture food processing equipment and 30 of these also make packaging machinery. Approximately 50 plants in all produce food packaging equipment. Most of these facilities operate under the jurisdiction of the Ministry of Machine Building for Light and Food Industry and Household Appliances, but some are controlled by other agencies such as the Ministry of Agriculture.

While the Soviet Union no longer seeks self-sufficiency in the production of food processing and packaging equipment, it intends to maximize its use of domestically produced equipment. Accordingly, the Five Year Plan for 1971-75 calls for a rapid increase in production from $416 million in 1971 to $871 million in 1975, representing an average annual growth rate of 20%. Local industry, however, proved unable to maintain the set pace and lagged $143 million behind assigned goals during the first 2 years of the Plan. The basic problem of producing modern machinery in sufficient quantity is likely to continue to impede the growth of the industry through the 1974-78 period.

Most domestically produced food processing and packaging equipment is utilized within the Soviet Union. None is currently exported to free-enterprise countries, and no plans to develop these export markets have been announced.

Third-country competition.—Although approximately 75% of all food processing and packaging equipment imported into the U.S.S.R. now originates in the CEMA countries, imports from nonsocialist countries are becoming increasingly important. West Germany, which in 1973 furnished about 50% of the imports from free-enterprise countries, has become the leading Western supplier. Sweden, Denmark, Italy, and France are also important sources of supply.

The CEMA countries receive privileged access to the Soviet market under separate trade and industrial specialization agreements. For this reason, the three leading foreign suppliers of food processing and packaging equipment to the Soviet Union in 1973 were East Germany, with an import market share of 29%, and Czechoslovakia and Hungary, with shares of 17% each. These countries' exports consisted primarily of items manufactured preferentially under CEMA specialization agreements; namely, packaging, beverage processing, and confectionery-making equipment (East Germany); beer brewing plants (Czechoslovakia); and fruit and vegetable processing equipment (Hungary).

Western manufacturers in 1973 ranked among the leading foreign suppliers of certain equipment categories. West Germany held an estimated 18% ($2.7 million) share of imports of beverage making equipment and a 7% ($1.3 million) share of sugar processing machinery imports; and Denmark and Sweden each held an estimated 13% ($4 million) share of dairy equipment imports. West Germany was also a principal seller of food packaging equipment, with sales of $12.1 million, or 14% of the import market in 1973.

West European manufacturers of meat processing equipment actively selling in the Soviet Union include the West German firms Kramer & Grebe KG, Atmos-Mittelhauser & Walter, Vemag-Verdener Maschinen GmbH., the Danish firm Atlas A/S, and the Dutch firm Seffelaer & Looyen B.V.

Dairy equipment is supplied by Alpma-Hain & Co. KG and Diessel GmbH. & Co. (both of West Germany), Alfa-Laval AB (Sweden), and Niro Atomizer A/S, Paasch & Silkeborg A/S, and Kolding (Denmark). Fruit and vegetable processing equipment is sold by Lubeca Maschinen und Anlagen and Karges & Hammer Maschinenfabrik (West Germany) and Rieber & Soen AS (Norway).

The principal firms selling beverage equipment include Steinecker, Seitz-Werke, and Strunck & Co. (West Germany); and Cofaleh and Cifal S.A. (France). Carle & Montanari (Italy) is a leading supplier of confectionery equipment, as is Buhler-Miag-Muhlenbau und Industrie GmbH. (West Germany), which also sells milling equipment. Rose Forgrove Ltd. (United Kingdom) sells bakery equipment, and Gotawerke (Sweden) supplies fish-processing equipment.

In the packaging equipment category, Massily (France) provides Soviet food processors with Eurotwist and Eurocap bottles- and jar-capping systems. Schmalback-Lubeca Werke, a West German subsidiary of the Stolle Corporation (United States), sells equipment for the production of easy-to-open cans.

Many West European manufacturers have been doing business with the Soviet Union over a period of years and benefit from the tendency of Soviet purchasers to deal with known suppliers. The West European position is particularly strong in sales of dairy and meat processing equipment.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, identifies the types of U.S.-made equipment expected to have good sales potential in the five largest sectors of the Soviet food processing industry. These are listed below. In general, the best potential lies in complete installations and processing lines rather than component machines.

Food Processing Equipment

Meat, poultry, and eggs.—Complete slaughterhouse and meat processing plants; production lines for frankfurters, sausages, and smoked meat products; equipment for the processing and packaging of ready-to-eat dishes; deep-freezing equipment; installations for the extraction of protein from the blood of slaughtered animals; and installations for the processing of bones.

Dairy.—Complete lines for vacuum evaporation with evaporated liquid capacities of 8,000-12,000 kilograms (kg) per hour, equipment for the pneumatic transport of powdered milk, installations for processing baby foods based on dehydrated milk, ice cream production equipment, separators, and homogenizers.

Sugar and confectionery.—Cocoa bean husking machines; shaping machines; and kneading, mixing, and blending equipment.

Beverages.—Complete installations for breweries with a capacity of 3 million hectoliters (hl) per year or more, automated wort processing installations, automated sudshouse installations, and equipment for semicontinuous brewing systems.

Fruit and vegetable.—Continuous sterilizing equipment, complete installations for the processing of fruit and vegetable-based baby foods, plants for the production of dehydrated soups, deep-freezing installations, and equipment for aseptic preservation and packaging.

Food Packaging Equipment

Forming, filling, sealing.—Bottling installations for the beverage industries; can-making machinery—especially for easy-to-open cans used in the meat and fish processing industries; theremoformers and blow-molders to produce polysterol cups and plastic bags for the dairy industry; automated filling equipment for the dairy industry—including lines for powdered milk and condensed milk; filling and sealing equipment for the fish, fruit, and vegetable processing industries; and vacuum packaging equipment for meat products and ready-to-serve foods.

Table 2.—U.S.S.R.: Basic data on food processing industry sectors, 1973

Sector	Sales by manufacturing establishments ($ billions)	Capital expenditures ($ millions)
Meat, poultry, and eggs	10.8	639
Dairy	10.0	560
Fruit and vegetable	4.0	178
Grain	7.8	141
Bakery	5.6	165
Sugar and confectionery	4.2	255
Fats and oils	3.5	127
Beverages	7.4	382
Fish and seafood	3.8	161
Miscellaneous food products	3.2	152

Source: Bureau of International Commerce, Office of International Marketing research study. Data based on U.S.S.R. statistics and trade source estimates.

Wrapping, packing.—Direct and outer wrapping equipment for the dairy and confectionery industries.

Marking, inspecting. — Bottle-inspection equipment and labeling equipment for the beverage industry.

Container/product/package preparation and handling.—Bottle-sorting and -cleaning systems, stackers, box setting-up equipment, and palletizing equipment.

The survey indicates that U.S. manufacturers should also find success in selling filleting, opening, and scaling machines to the Soviet fish processing industry, and continuous dosing, kneading, and mixing equipment to the bakery industry.

The Food Processing Industry

The food processing industry in the Soviet Union in 1972 consisted of approximately 12,000 plants employing a total of some 650,000 workers. The average plant had 60 or fewer workers, and a very small number employed more than 500. Total sales by food processors in 1973 amounted to $60.3 billion (see table 2), while value-added production amounted to only about $17 billion. Productivity was low because about 40% of the labor force was engaged in manual labor and much of the equipment in use was obsolete. Capital expenditures in the industry totaled approximately $2.8 billion in 1973.

Food spoilage due to lack of refrigerated storage facilities has become a serious problem as losses have mounted to over $1 billion annually. Soviet authorities are giving priority to acquisition of adequate refrigeration equipment rather than large-scale expansion of frozen food processing. Quickfreezing is presently limited to experimental use; trade sources indicate that purchases of quickfreezing equipment barely exceed $1 million annually.

Food packaging techniques used in the U.S.S.R. also need further development—for example, only 35% of the food sold at retail is prepackaged; glass is more common than metal cans, and wood remains the principal packaging material. Rising labor productivity requirements, increasing losses due to poor packaging, and planned expansion of the processing industries are combining to focus new attention on packaging techniques. Current planning calls for an increase in the use of metal cans, with tin cans outnumbering glass containers by a ratio of 4-to-1 by the end of 1975; the rapid replacement of wood with plastics, paper products, and nonferrous metals and metalcoated sheets; and a substantial rise in the proportion of prepackaged foods sold at retail.

A review of the five food processing industry sectors with the largest growth potential follows. Plans for each provide for particularly high rates of investment to achieve large production increases.

Meat, poultry, and egg processing.—This sector in 1973, produced some 8.3 million tons of industrially processed meats and 2.7 million tons of sausages, in each case an increase of 17% over 1970 levels. The typical plant is the "combinat" slaughterhouse with processing lines. However, sausages and canned meats are usually made in smaller meat factories rather than in combinats. The larger installations, with productive capacities of 30 to 100 tons per shift, account for 15-20% of total production.

Capital investment by the meat processing industry in 1973 totaled $639 million, of which $40 million was for poultry processing. Expenditures programed over the 1971-75 period total $2.7 billion (exclusive of poultry processing); they are designated primarily for the establishment of 146 new plants. A further investment of $1.34 billion for construction and expansion of meat processing facilities is projected for the 1975-78 period. The current Five Year Plan provides for 130 new poultry plants, 70 of which were to be completed during 1974 and 1975. An additional 40 or 50 plants will probably be constructed in the 1976-78 period.

The Ministry for Meat and Dairy Industries is responsible for the operation of the meat processing industry and for planning and investment concerning it; poultry processing is under the jurisdiction of a separate agency, the Administration for Industrial Poultry Production.

The major trend in meat processing is toward greater concentration and automation. The newer combinats usually have capacities of 50 to 100 tons per shift, and still larger plants are planned. One prototype plant has a processing capacity of 150 tons of meats and 15 tons of sausages per shift, plus refrigerated storage capacity of 6,000 tons, and plants with production capacities of 200 tons per shift are under consideration.

Recent technological innovations adopted by Soviet meat processors include the production of skinless sausages, the use of pH probes for the continuous control of organic preparations, the application of ultrasound to the drying of blood and soup concentrates, and the use of liquid heat carriers and induction currents in heat treatments. Soviet research institutes are examining the production of inert, protective coatings from polymers. An automatic data processing system (ASUP) to oversee factory operation has been developed for use on an industry-wide basis and is currently being tested in a combinat at Sverdlovsk.

Advanced processing installations include: complex mechanized lines for sausages, in which all phases from the preparation of the emulsion to packing are continuously controlled; an experimental operation for continuous pickling and curing; an automated installation for the refining of 1,500 kg of animal fat (a continuous process in which the fatty substance is fed into the separator without prior centrifugal treatment); and a plant with mechanical equipment to stun animals, treat carcasses, and automatically process the blood. In the poultry subsector, the latest equipment permits the processing of 3,000 chickens or 2,000 ducks hourly.

When choosing equipment, the Soviets place emphasis on operating safety and on performance. Equipment must usually operate at full capacity for production goals to be achieved.

A profile of the system operating in a meat combinat at Ugliche illustrates the kinds of equipment used in one of the larger and more modern plants. Most of the equipment was installed in 1972, and productive capacity exceeds 50 tons per shift.

Animals entering the plant are electrically stunned, then transported on conveyors for slaughtering and carving. The sausages are produced on fully automated lines; meatballs are stamped on stainless steel processing conveyors, and packaged meats for retailing are precooled, mechanically cut, electronically weighed, and packed in plastic. The plant has vacuum packing machines based on inert gas and ultraviolet radiation for sausage dehydration. Some processes, such as ventilation, autoclave sterilization, and pig-scalding are remotely controlled.

Most of the equipment in use at this combinat is of domestic origin. Two important foreign suppliers are German: Kramer & Grebe, which manufactured the production line used for raw-smoked sausages, and Atmos, which built the universal chambers used for the thermal treatment of sausage products.

Dairy products manufacturing.—Milk production in the Soviet Union in 1973 amounted to 21.1 million tons, about 7% above 1970 output. In the same period, butter production rose by 25% to 1.2 million tons, and cheese by 10% to 530,000 tons.

The Ministry for Meat and Dairy Industries favors the establishment of extensive, highly automated production units; the largest such plant, with a capacity of 720,000 kg of milk daily, is located near Moscow. Large establishments, however, are not yet the rule. Only about 10-20% of the country's raw milk is processed in plants with capacities in excess of 100,000 tons annually.

Capital investment by the dairy industry in 1973 amounted to $560 million. The 1971-75 Five Year Plan provides for the establishment of 128 large and 74 smaller dairy plants in rural areas, 10 factories for whole powdered milk production, 72 plants for skimmed powdered milk, 5 plants for canned milk, 95 cheese plants, and 6 butter factories. About 60% of these installations remained to be constructed at the end of 1973. New plants are expected to be built at the rate of 80 to 100 annually between 1975 and 1978.

Newer dairies in the Soviet Union have automated milk reception, pasteurizing, and refrigerating equipment affording hourly capacities of 20,000 to 25,000 liters, and separators having hourly capacities of 10,000 to 15,000 liters. Cheese production troughs with capacities of 10,000 liters are being installed in a number of dairies.

Recently constructed cheese plants are of two types—those strictly for cheese production, with a processing capacity of 50 to 100 tons of milk per shift, and those with a capacity of 200 to 300 tons of milk per shift, yielded skimmed milk products as well as cheese. Modern techniques used in production of hard cheese are progressively reducing the ripening period, and a universal emulsion for cheese coatings during the ripening process is under development.

Advanced technology and automation are also being applied to the production of kefir, a fermented milk beverage. One of the more modern plants, a dairy combinat located at Sochi, automatically controls the temperature and acidity for a daily kefir output of 80,000 bottles.

The newer powdered milk factories, which have daily capacities of 4,000 hl, also supply fat for butter production and skimmed milk for mixed feed. A few plants are equipped with fully automated measuring and control instruments. The only major segment of the dairy industry that lacks continuous, automated systems is butter production.

A milk combinat at Riga that delivers 86% of its goods in packaged form is one of the leading enterprises of the Soviet dairy industry. The plant processes between 650 and 700 tons of milk during a 24-hour period; output includes 24 tons of canned cream products, 90 tons of yogurt packed in glass containers, and 46 tons of dehydrated milk packaged in laminated paper bags.

Much of the equipment in use at this combinat was installed in 1971 and 1972. The equipment includes three plate- and tube-pasteurizers with a total capacity of 10,000 liters hourly at a temperature of 92° to 95° Centigrade. A cool line for the production of kefir also has a 10,000-liter hourly capacity. The 12 plate-cooling-pasteurization lines have a 15,000-liter hourly capacity for the production of canned cream; 5,000 containers of cream can be filled per hour. Milk transportation within the installation is fully mechanized, as are tank cleaning and filling operations.

Some of the plant's equipment is imported. Machinery for the packaging of soft cheeses was manufactured by Hassia, and a machine for ice cream packaging was furnished by Franz Haas, both West Germany firms. Ice cream is produced with Hermetia Derby equipment from Italy.

Sugar refining and confectionery manufacturing.— The Soviet Union produced about 10.7 million tons of granulated sugar and 3.1 million tons of confections (including durable bakery goods) during 1973, when the country had one of the highest per capita rates of sugar consumption in the world. All sugar production is based on beets.

Most plants are small; data for 1972 indicate a total of 291 sugar refining plants, more than one-half of which had a processing capacity below 2,000 tons per day. Only 13 had capacities of over 4,000 tons per day. The Ministry for the Food Industry has jurisdiction over sugar refining and confectionery production, but the two branches operate under separate administrations: Glavkonditer is the Administration for the Confectionery and Sweets Industry, and Glavsakhar is the Administration for the Sugar Industry.

Capital expenditures by sugar refiners amounted to $204 million in 1973, and those by confectionery producers were estimated at an additional $51 million. The 1971-75 Plan has set as a goal the construction of 13 new sugar beet refineries, and trade sources predict that 10 more new plants will be built during the 1974-78 period. Current plans, based on greater use of truck transport to increase collection areas, allow for plants with capacities of 6,000 tons per day and others with capacities as high as 9,000 or 10,000 tons if possible. Another goal is the establishment of a few very large plants capable of serving entire regions.

As a matter of official policy, the trend in the industry is toward greater mechanization and automation, in particular the introduction of automatic diffusion processes to all plants. In 1970, only 28% of sugar refining processes in the leading plants were automated; also, although 71% were mechanized, the technical level of the materials-handling equipment was very low. Requirements for increases in packaging machinery are likely. The planned expansion in output of confectionery products should also require investment in new equipment.

The Girbovski sugar factory in the Moldavian Republic has a typical sugar beet processing line. Total capacity is about 3,000 tons per 24 hours, which is standard for a plant equipped during the early 1970's.

The factory uses a jet-spray process to clean and transport the beets for shredding, an electronic conveyor that continuously moves the shreds to a diffusion installation, dehydrating apparatus based on a hot-air turbulence method with high heat-exchange coefficients, equipment for a two-stage saturation procedure, and rotating drum filters for liquor filtration. The sulfur dioxide bleaching practice now in use is to be replaced by an ion-exchange cleaning process. The packaging of the final product in bags is fully automated. All of the automated processes in the factory, including power generation, are sequentially controlled.

Beverage manufacturing.—Beverage processing has excellent growth potential in the Soviet Union, in view of official policy to encourage the production of soft drinks, beer, and wine. Estimated production by category in 1973 was 32 million hectoliters (hl) of noncarbonated soft drinks, 1.5 billion half-liter bottles of carbonated soft drinks, 740 million standard cans (353.4 cubic centimeter) of fruit juices, 52 million hl of beer, 30 million hl of wine, and 100 million bottles (0.75-hl) of sparkling wine.

The Ministry for the Food Production Industry supervises all beverage production, investment, and planning. The major industry sectors operate under three individual administering agencies. Glavvino, the Central Administration for wineries; Glavpivo, the Central Administration for Beer Breweries and the Nonalcoholic Beverage Industry; and Glavspint, the Central Administration for the Alcohol and Spirituous Liquor Industry.

At present, most of the individual-producing units in the industry are small. For example, few beer breweries had capacities in excess of 500,000 hl annually. The trend, however, is toward the establishment of much larger plants.

Capital expenditures by beverage producers in 1973 amounted to approximately $382 million. The 1971-75 Plan, under which the investment took place, called for a doubling of the nation's beer output through the establishment of new breweries with capacities ranging as high as 3-4 million hl annually. Total investment allotted for brewing under the Plan is $1.18 billion, with this to include the purchase of modern packaging equipment as well as other machinery.

In the production of pure alcohol, the Plan provides that the currently used molasses base be replaced with cereals and potatoes. Advanced rectifying equipment for the raw materials will be imported for prototype units with capacities of 10,000 to 60,000 liters per day, and boiler rooms will be rebuilt to accommodate gas and liquid fuels.

The principal trends in beer brewing are horizontal arrangement of equipment and adoption of semicontinuous and accelerated fermentation and after-fermentation procedures. The process developed by the Belgian firm Soberi is of particular interest to the Soviets because it reduces the amount of industrial space necessary. Procedures of Soviet and Czechoslovak origin which reduce the amount of processing time are also being considered. Czechoslovak machinery, including Mammo malt-preparing equipment with capacities of 2, 3, and 6 tons per hour, is now widely used in Soviet brewing plants.

The most advanced system used for bottling beverages in the Soviet Union has a capacity of 24,000 bottles per hour. Bottles are removed from cases automatically, cleaned, filled, and repacked in cases. A pilot project for the system is in operation at the Moskvarezke beer brewery near Moscow.

Pilot plants for the distillation of alcohol from starchy materials have recently begun operations. A typical process in one such plant, with storage facilities for 1,000 to 3,000 tons of cereals, has mechanical twin buckets or dumping cars for unloading freight and pneumatic conveyors to transport the cereals to the separator. Roller or hammer mills are used for crushing. Continuous-process distillation is carried on by vacuum cooling.

Fruit and vegetable processing.—Soviet data indicate that processors produced 6.3 billion standard cans of fruits and vegetables and about 4 million tons of frozen fruits and vegetables in 1973. The average cannery had a production capacity of 6 to 7 million cans annually. The few larger plants (those with yearly capacities in excess of 50 million cans) accounted for an estimated 15-20% of total production. Capital investment in the fruit and vegetable processing industry during 1973 amounted to $178 million.

The Ministry for the Food Production Industries supervises the industry through a central administrative agency, Glavkonserv. Some plants, however, are operated directly by State-owned collective farms. Plans called for a total of 22 new factories during 1971-75, of which 10 or 12 remained to be constructed in 1974 and 1975. A similar rate of expansion is expected for the 1975-78 period.

Processing lines in the newer plants typically handle 100,000 cans per shift of tomato puree, green peas, cucumbers, and fruit juices—a capacity equivalent to 15 million cans annually. Even larger plants are planned for the future.

Although production at present consists primarily of simply packed fruits and vegetables, the industry is developing the production of semifinished and ready-to-eat foods in 10- and 20-portion packages for sale to factory cafeterias and has introduced dehydrated soups. Productivity is relatively low, largely because of labor-intensive packaging operations.

Recent developments in the industry include the use of electrolytically tinned cans, aseptic preservation processes for the simultaneous sterilization of contents and packaging, and the manufacture of ready-to-eat meals with the aid of mechanical apportioning and packaging devices. Research is concerned with the adaptation of aseptic sterilization techniques to solid foods and with the development of aluminum and polymer-coated containers.

The trend toward the use of tin cans should accelerate with the establishment of planned central can manufacturing plants. A factory to be built by Karges & Hammer of West Germany will serve as the prototype.

A cannery located at Krimsk is among the larger fruit and vegetable processing plants in the Soviet Union. It has an annual capacity of some 200 million standard cans, or 80,000 tons, and employs 4,000 workers. The products processed are peas, cucumbers, corn, tomatoes, strawberries, and cherries. Equipment in use includes: 13 blanching devices with a daily capacity of 2.5 million standard cans; 76 vertical autoclaves, each with four baskets, for a total capacity of 2,200 standard cans per load; and 16 additional autoclaves for pressure cooling. Autoclave loading and unloading are done by hand; the loaded baskets are transported by electric forklift trucks. Only simple control instrumentation is used.

In the pea canning process, Hungarian instruments are used to test age and tenderness. The produce arrives at the plant shelled, in tank trucks carrying the peas in water. The tanks are emptied into storage containers from which the peas are later carried by water stream to the blanching station.

Italian equipment manufactured by Tito Manzini is used for tomato processing. The plant also uses some Yugoslavian equipment, manufactured by Jedinstvo, but most of the machinery is of domestic origin.

Trade and Technical Regulations

Detailed information on Soviet trade regulations applicable to imports of food processing and packaging equipment may be obtained from the Office of East-West Trade Development, BEWT/DIBA, U.S. Department of Commerce, Room 4323, Main Commerce Building, Washington, D.C. 20230.

Electrical power supply is 110, 127, and 220 volts a.c., 50 hertz. The metric system of weights and measures is used.

Imports are not generally required to comply with Soviet technical standards, and no labeling requirements apply to imported machinery. The agency responsible for determining and publishing standards for domestically produced equipment is The Council for Standards, Measurements, and Measuring Instruments of the Council of Ministers of the U.S.S.R. (Komitet standartov, mer i ismeritel'nykh priborov pri Sovete Ministrov SSSR), Leninskiy Prosp. 9, Moscow M-49, U.S.S.R.

Information on the availability of published standards for food processing and packaging equipment in the Soviet Union may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y., 10018.

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on the U.S.S.R. to supplement this report is available on a continuing basis from:

Director, U.S.S.R. Division
Office of East-West Trade Development
BEWT/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-4655

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in the U.S.S.R.," DIB-74-12-518, September 1974.

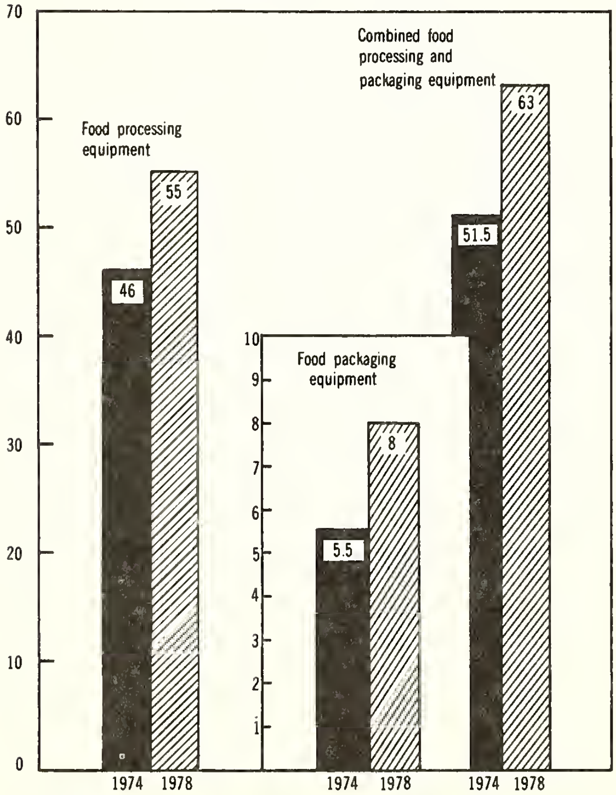
The Office of Export Development also has available for $3.00 a "Target Market Trade List: Food List: Food Processing and Packaging Equipment —U.S.S.R." which identifies major prospective customers, and potential agents and distributors, trade publications and trade associations.

Venezuela

The Venezuelan government has committed itself to developing local food industries in an effort to reduce the country's dependence on imports. This drive toward self-sufficiency, coupled with continuing expansion of the country's sugar industry, is expected to boost the combined market for food processing and packaging equipment in Venezuela to $63 million[1] in 1978, up from $51.5 million in 1974 (see table 1). Heavy governmental investments in sugar production alone will account for purchases of $70 million worth of food processing and packaging equipment in the period from 1974 to 1978.

Venezuela: Food processing and packaging equipment market, 1974 and 1978.

(in millions of U.S. dollars)



Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Venezuelan trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

The long-range growth of the food processing and packaging equipment market may be somewhat uneven. It is noted that the past growth trend incorporated a decrease in 1973 sales to $40.7 million from the $47.5-million level of 1972. This temporary slowdown was halted, however, in 1974.

The principal reason for the erratic growth pattern of the market was the development of the sugar processing industry. Large purchases of equipment by sugar refiners depend on the construction schedules of plants being built. Purchases to equip new sugar mills were substantial in 1972 and 1974 and are expected to continue at a high level during 1975 and 1976. Thereafter, they may level off as major construction projects in the sugar industry are completed.

Sales of *food processing equipment* in 1972 amounted to $43 million, declined in 1973 to $36 million, rose in 1974 to $46 million, and are expected to reach $55 million in 1978.

Because there are so few domestic firms engaged in producing food processing equipment, virtually the entire market is served by foreign suppliers. Imports totaled $44 million in 1974 and are projected to reach $52 million in 1978. Roughly 50% of the equipment imported into Venezuela is manufactured in the United States.

Sales of *food packaging equipment* grew briskly during the period from 1972 through 1974, rising at an average yearly rate of 10.6%, from $4.5 million to $5.5 million. Projections indicate that the

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1 = Bs. 4.50 (1971); Bs. 4.40 (1972); Bs. 4.32 (1973 and subsequent years).

Venezuela—Economic Indicators
(1973)

Gross national product:	**$15.8 billion**
Total country imports:	**$2.4 billion**
Imports from U.S.:	**$1.0 billion**
Total country exports:	**$4.6 billion**
Exports to U.S.:	**$1.9 billion**
Population:	**11.3 million**

market will continue to rise at close to a 10% annual rate through 1978, with sales expected to reach $8 million in that year. A major factor stimulating this growth is the trend toward prepackaging of food products previously sold in bulk.

The market structure for food packaging equipment is similar to that for food processing equipment, with domestic manufacture playing a small role. Imports totaled $4.5 million in 1974 and are expected to reach $7 million in 1978. U.S. producers currently supply 55% of imports.

Competitive Environment

Although local industry is protected by tariffs, Venezuelan businessmen have been slow to invest in enterprises to manufacture food processing and packaging equipment because the limited size of the domestic market would make operations minimally profitable. Only one Venezuelan firm, Euro-Forni de Venezuela C.A., specializes in food processing equipment. It makes ovens, molders, mixers, and other equipment on a scale suitable for small neighborhood bakeries. Several other firms occasionally manufacture food processing items as a sideline, or limit themselves to such general-use products as storage tanks, stainless-steel tanks, liquid pumps, and conveyer and pipeline systems. Another local firm, Gaza C.A., of Caracas, has been identified as producing mechanical bag-filling machines, but its annual output is meager. No increase in local manufacture is expected in the near future.

European-based producers are the principal competitors to U.S. manufacturers in the Venezuelan market for food processing and packaging equipment (see table 2). Chief among these, with the industry sectors for which they supply equipment shown in parentheses, are: Brodrene Gram, and Paasch & Silkeborg (dairy products manufacturing), both of Denmark; Ferrostall, of Germany (fruit and vegetable processing); Miag, of Germany, and Buhler, of Switzerland (grain milling); Hansel, of Germany (bakery products manufacturing); and M.R.N. of Italy (beverage manufacturing).

Among the numerous third-country suppliers selling processing and packaging equipment to sugar refiners and confectionery manufacturers are: Mirrless-Watson, Fletcher and Steward Ltd., Fives-Carl Babcock, Sucrest, Baker-Perkins, and Jacobs, all of the United Kingdom; Ferrostall, Main, Drais, Bauermeister, and Hansel, of Germany; Gino Frau S.A.S. and Carle Montanari, of Italy; SIG, of Switzerland; Atlas and Brodrene Gram, of Denmark; and Dendini-Masua, of Brazil.

Certain sectors of the Venezuelan food industry have built-in biases that favor one foreign supplier over another. A large number of the smaller food processing companies are operated by immigrants from Europe who prefer to work with equipment they already know. In addition, food processing plants in Venezuela are frequently subsidiaries or licensees of foreign-based companies. In these plants, the original plans (and indeed all the machinery) may have come from the parent firm, and additional equipment must be compatible with that already installed.

Marketing techniques appear to be similar among foreign suppliers of food processing and packaging equipment. Price is not a major element of competition. Venezuelan end-users are mainly small- to medium-size companies which require multipurpose machinery of moderate, single-run capacity. Thus the Venezuelan market for highly specialized and automated equipment of the type sold to American food processors has been relatively small. It is expected that plans for future expansion in the sugar sector will include a greater quantity of highly automated refining and handling machines.

Table 1.—Venezuela: The market for food processing and packaging equipment, 1973, 1974, and 1978
(in millions of U.S. dollars)

	1973	1974	1978
Food processing equipment (by sector)			
Sugar and confectionery	8.00	17.00	12.0
Dairy	6.00	7.00	10.0
Beverages	5.00	5.50	8.0
Other sectors	17.00	16.50	25.0
Subtotal	36.00	46.00	55.0
Food packaging equipment			
Forming, filling, sealing	2.35	3.00	4.0
Wrapping, packing	1.18	1.25	2.0
Marking, inspecting	.47	.50	.8
Container/product/package preparation and handling	.70	.75	1.2
Subtotal	4.70	5.50	8.0
Total food processing and packaging equipment	40.70	51.50	63.0

Source: Bureau of International Commerce, Office of International Marketing research study. Values based on Venezuelan trade source estimates and projections of equipment purchases ultimately made by domestic end-users.

Table 2.—Venezuela: Imports of selected categories of food processing and packaging equipment by country of origin, 1971-73

(in thousands of U.S. dollars)

	1971	1972	1973
Food Processing Equipment			
Machines to refrigerate, freeze, or make ice and ice cream			
United States	2,606	3,269	3,900
Italy	300	398	600
West Germany	53	49	120
United Kingdom	40	2	60
Others	465	536	1,320
Total	3,464	4,254	6,000
Machines to grind and process cereals or vegetables			
United States	378	888	950
West Germany	265	812	900
Italy	506	249	270
United Kingdom	10	32	30
Others	564	942	900
Total	1,723	2,923	3,050
Ovens for bakery, pasta, confectionery, pastry, chocolate, meat preparation and canned goods industries			
United States	223	125	170
Italy	664	510	500
West Germany	68	10	100
United Kingdom	—	—	—
Others	339	189	230
Total	1,294	834	1,000

	1971	1972	1973
Processing machines and mechanical utensils for the bakery, pasta, confectionery, pastry, chocolate manufacturing, meat preparation, and canned goods industries			
United States	825	1,037	1,250
Italy	1,148	1,619	2,000
West Germany	313	477	500
United Kingdom	68	273	250
Others	622	751	1,000
Total	2,976	4,157	5,000
Machinery for refining of sugar			
United States	116	527	250
United Kingdom	2,171	10,837	3,250
West Germany	90	38	250
Others	78	4,348	1,250
Total	2,455	15,750	5,000
Packaging Equipment[1]			
Machines to clean, dry, fill, or label bottles or other containers; other packaging machines			
United States	3,013	2,632	3,025
West Germany	832	978	1,100
Italy	406	413	275
United Kingdom	75	162	275
Others	565	753	825
Total	4,891	4,938	5,500

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[1] Since Venezuelan official trade statistics do not differentiate between packaging equipment for food and non-food uses, both types of equipment are included in these figures. Food packaging equipment is estimated by Venezuelan trade sources to account for 70% of total packaging equipment imports.

Source: *Boletin de Comercio Exterior,* 1971-72, Ministerio de Fomento, Direccion General de Estadistica y Censos Nacionales, Caracas. Data for 1973 are estimates based on partial year (January-March) official statistics.

Sales Opportunities

A market research survey recently conducted for the Bureau of International Commerce, Office of International Marketing, indicates that American manufacturers will find strong demand in Venezuela for the following types of equipment.

Food Processing Equipment

Sugar and confectionery.—Cane defibrators, crystallizing apparatus, crushing machines, diffusing apparatus, steam ovens, balances, evaporators, centrifuges, cocoa bean husking machines, shaping machines, tabletting machines, chewing gum equipment, pumps for water and other liquids, texture testers, recording thermometers for cooking cycles, blenders, sterilizing systems, and materials handling equipment.

Beverages.—Filtering machinery, carbonating equipment, concentration control equipment, mashing vats with agitators and heating elements, germination machines, clarifiers, straining vats, liquid pumps, compressors, condensers/evaporators, refrigerated bulk cooling tanks, heat exchange systems, sterilizing systems, essence recovery systems, recording thermometers, and materials handling equipment.

Dairy.—Butterworking/making machines; centrifugal cream extractors; homogenizers; pasteurizers; spray-driers for preparation of powdered milk; cheesemaking machines; ice cream preparation and freezing, cutting, and coating equipment; condensers/evaporators; refrigerated bulk cooling tanks; compressors; centrifugal milk clarifiers; bag opening/dumping equipment; pumps for liquids; sterilizing systems; and materials handling equipment.

Meat, poultry, and eggs.—Beaters, dehairing machines, molding machines, compactors, sausage-stuffing machines, and bone choppers.

Fruit and vegetable.—Dehydrating equipment, juice extractors, pulpers, vacuum gravity separators, vegetable graders, fruit drying equipment, cooling/freezing equipment, paring machines, washing machines, strip cutters, and slicers.

Grain.—Flour bleaching machines, crushing machines, flour or bran blending equipment, grinders, and graders.

Bakery.—Biscuit/wafer/cracker machines, enrobing machines, and continuous-process ovens.

Fats and oils.—Oil-seed crushers, grinders, and margarine-making machines.

Fish and seafood.—Filleting, grinding, and freezing machines.

Food Packaging Equipment

Forming, filling, sealing.—Vacuum thermoformers; pressure thermoformers; fillers for liquid, solid, viscous, and dry products; heat sealers; injection blow-molders; can closers and sealers; corking equipment; tying, sewing, and stapling equipment; vacuum form/fill/seal systems; and aerosol form/fill/seal systems.

Wrapping, packing.—Outer and overwrap wrappers, shrink-wrappers and tunnels, multipackers, and cartoners.

Marking, inspecting.—Labelers, coding equipment, code/label inspecting equipment, can wrappers, imprinting/printing equipment, and weighers.

Container/product/package preparation and handling.—Box setting-up equipment, palletizers, feeding/orienting equipment, stackers, unscramblers, and unloaders.

The Food Processing Industry

Venezuela's food processing industry, comprising approximately 1,600 plants, produced nearly $1.4 billion worth of goods in 1971 (see tables 3 and 4). The three largest sectors in terms of sales in 1971 were beverage manufacturing, dairy products manufacturing, and grain milling, but the sugar and confectionery sector capitalized at twice the level of any of the others.

Table 3.—Venezuela: Number of enterprises in food processing industry sectors by size[1] *of enterprise, 1971*

Sector	Large	Medium	Small
Meat, poultry, and eggs	3	10	44
Dairy	8	10	82
Fruit and vegetable	5	15	23
Grain	6	30	100
Bakery	10	100	761
Sugar and confectionery	15	15	32
Fats and oils	4	5	5
Beverages	10	40	96
Fish and seafood	2	3	10
Miscellaneous food products	10	30	100

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[1] Large = 500 or more employees.
Medium = 101-499 employees.
Small = 100 or fewer employees.

Source: *Estadisticas Industriales, 1971*, Ministerio de Fomento, Direccion General de Estadistica y Censos Nationales, Caracas, 1973, and *Directorio Nacional de Establecimentos*, Ministerio de Fomento, 1973.

The materials currently used for packaging the products of the various food processing industry sectors are conventional ones that reflect the intermediate level of development for the industry as a whole. Sugar generally is packaged in cloth sacks and paper bags, and candies are wrapped in cellophane, foil, and paper. Beverage producers continue to use glass as their principal packaging material. Soft drinks in tin cans have only recently become an accepted part of the market. Dairy goods are sold in various types of containers. Dried milk in tins is very popular, because many domestic consumers have no refrigerators. Fresh milk is usually sold in plastic-coated paperboard cartons and butter comes in foil-paper wraps as well as plastic tubs.

Most meat carcasses still go from slaughterhouses to wholesalers and retailers in bulk, without any packaging. In some retail outlets, the cuts of meat may be put in plastic or cellophane-covered paperboard trays. Juices, fruits, and vegetables are marketed almost entirely in tin-plated cans. Jams, jellies, and baby foods are put up in glass jars.

Bulk shipments of grain products are packed in plastic bags; paper is generally used for smaller quantities, but plastic bags are now being used as well. Large containers for crackers, cookies, and other foods intended for shelf storage are usually tin-plated canisters.

Containers used in the fats and oils sector are now mainly plastic, although some firms still use glass bottles. Fish and seafood products are packed in tin-plated cans. Other food products are packed mainly in glass and paper.

Shortages and high costs of paper and plastic have encouraged manufacturers in the various sectors to look for new sources of materials. No radical changes in materials usage are expected in the near future, but in the longer term, a new petrochemical complex in Venezuela may provide the resources for domestic production of plastics for packaging.

Quickfreezing may gain acceptance in the food industry within 3 or 4 years. One distributor is currently negotiating with various European suppliers to offer quickfreezing equipment to Venezuelan food processors. Prime customers for such equipment would be found in the fruit and vegetable, meat products, and seafood sectors.

Two factors affecting Venezuelan industry in general—membership in the Andean Common Market and prevailing price controls—will have some influence on the country's food processing industry. The relationships between the many foreign-owned firms in the food processing industry and their parent companies may change in the near future as a result of Venezuela's entrance into the Andean Common Market in 1974. As a condition for membership, Venezuela adopted the Common Market agreements regarding domestic control of foreign investments, treatment of royalties, and control of licensing and other contractual arrangements with foreign firms. The Venezuelan Government, an aggressive advoçate of such restrictions, has announced plans not only to limit future operations of foreign investors but to reexamine existing economic ties as well. However, the extent of any changes or their effects on the food processing industry cannot yet be determined.

The second factor, the Venezuelan price control program, was initiated by the Government in 1974. While many food processing firms have suspended plans for expansion, most observers believe that the price controls will be lifted soon, and growth prospects for the future are not expected to suffer.

The Government's principal development effort in the food processing industry is its planned expansion of sugar production. Because of this major emphasis on its development, the sugar and confectionery sector is presented in the profiles which follow, along with the two largest sectors, beverage production and dairy processing.

Sugar refining and confectionery manufacturing.—Sugar and confectionery production in Venezuela is increasing rapidly. Total output rose from 659,400 metric tons (MT) in 1970 to 827,400 MT in 1972, reflecting an average annual growth rate of more than 12% over the 2 years. Refined sugar production amounted to 483,300 MT in 1972, brown sugar 35,000 MT, and molasses 269,100 MT. Chocolate and cacao products output increased by 50%—from 8,000 MT to 12,000 MT—in the 1970-72 period, and production of other confections rose from 23,000 MT to 28,000 MT.

Roughly 70% of total sector sales are made by enterprises having 500 or more employees. Six of the country's largest sugar mills are owned and operated by a government corporation, Centrales Azucareros C.A., a branch of the national development corporation—Corporation Venezolano de Fomento (C.V.F.). The Government also finances three other large mills—one run by Corporiente, a quasi-official financial agency—and the other two underwritten with both public and private monies. The Vollmer group is a wholly private corporation also engaged in large-scale refining operations; it owns two sugar mills and a large rum plant. The confectionery subsector is dominated by Industrias Savoy C.A., which controls more than 80% of the market.

The C.V.F. has adopted a 5-year National Sugar Plan, to run from 1975 to 1980. Under this plan, $406.6 million will be invested in increasing sugar growing and refining capacity. Of the total sum, $201.7 million is slated for land cultivation and $204.9 million is earmarked for construction of new refineries and expansion of existing mills. Roughly 75% of the total investment figure will be allocated to Centrales Azucareros, and the remainder will be funneled into mixed public and private operations.

Table 4.—Venezuela: Basic data on food processing industry sectors, 1971

(in millions of U.S. dollars)

Sector	Sales by manufacturers	Production	Annual expenditures for equipment[1]
Meat, poultry, and eggs	89.4	89.9	1.0
Dairy	205.7	209.4	5.0
Fruit and vegetable	65.9	69.5	1.0
Grain	174.4	182.7	6.0
Bakery	72.7	73.3	6.0
Sugar and confectionery	113.4	128.1	12.0
Fats and oils	121.2	124.6	3.0
Beverages	278.7	295.3	6.0
Fish and seafood	35.5	38.1	.5
Miscellaneous food products	152.1	154.0	2.0

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[1] Food processing and packaging equipment only.

Source: *Estadisticas Industriales, 1971,* Ministerio de Fomento, Direccion General de Estadistica y Censos Nationales, Caracas, 1973, and Venezuelan trade source estimates.

Under the National Sugar Plan, annual production of refined sugar is projected to rise from 592,000 MT in 1975 to 1.1 million MT in 1978 and 1.3 million MT in 1980.

Of the six mills already operating under Centrales Azucareros C.A., Central Rio Turbio is the largest, with a capacity of 6,000 MT a day. C.V.F. Central Rio Yaracuy now refines 4,000 MT a day but is slated to expand to 7,000 MT when current construction is completed. C.V.F. Central Cumanacoa has a daily capacity of 3,000 MT; C.V.F. Central Tacarigua, 2,000 MT; and C.V.F. Central Motatan and C.V.F. Central Urena, 1,200 MT each.

Investment plans by Centrales Azucareros during the 5-year National Sugar Plan include major expansion and modernization of these six mills and the construction of three completely new mills. Each of the new mills, with a planned capacity of 6,000 MT daily, is budgeted at $19.5 million.

Private investment is also up. Three mills, now in the planning stages, should be operating within 2 years. These are Central Carora (with a projected daily capacity of 4,000 MT), Central Rio Guanare (3,000 MT), and Central Pie de Monte (2,500 MT).

Generally, sugar mill operations in Venezuela are similar to those in the United States and Europe. However, the Central Melaport sugar mill, which began operations in September 1974, uses a new processing technique developed in Venezuela called Rotocel. Instead of the traditional method of grinding the cane to obtain syrup, a diffusor technique is employed. The syrup is leached from the cane in an 18-cell centrifuge-type machine and then reduced by a battery of four evaporator units into a concentrated form that can be readily transported to refineries. According to reports, one truckload of the concentrated syrup is the equivalent of 20 truckloads of cane.

The Rotocel process can be used economically in fertile areas of as few as 1,000 acres, because the installation requires only 40% of the investment needed for standard sugar mills. By contrast, new areas opened for planting must comprise at least 10,000 acres to be profitable if standard grinding devices are used. Another economical feature of the Rotocel process is that it can be used the year round, to extract edible oils from sesame seeds, corn, or peanuts during intervals between cane harvests.

The Rotocel process, developed by a Venezuelan who holds world rights to the system, has generated considerable interest abroad. Firms from at least four other countries have begun negotiations to use the process.

A more characteristic sugar refining process is that used at Central El Palmar S.A. This installation, owned by the Vollmer group, is currently the largest mill in the country and is considered to have the most advanced operations of the conventional sort. With a capacity of 6,500 MT daily, it accounts for 14.5% of the country's total sugar output capability. The equipment in use is several years old. Most of the cane entering the plant is unloaded on a chain conveyer system and is ground by three chopping lines. One line employs a 500 hp motor with 12 knives, the second a 900 hp turbine and 30 knives, and the third another 900 hp turbine with 72 knives. There are six mills, each with a 1,000 hp turbine.

Three kettles cook the chopped and round cane. Two of the kettles can use either bagazo (bagasse) or gas, and one uses only gas. Two purifiers are used, each with five trays and a capacity of 115,000 gallons (gal). Farther along the line are 11 evaporators. Three of these have mechanical circulators. Each evaporator has its own condenser system of sprinkling and jet action.

There is one cooler. Three crystallizers handle the first two stages, with 14 more reserved for the third stage. There are five granulators, including one for residuals. The sugar then flows through eight automatic centrifuges. Treatment with phosphoric acid and lime is automatic. There are five purifiers, five autofilters, two security filters, one triple evaporator, and two dryers.

For packaging the refined sugar, two hoppers with 500 tons total capacity pour the sugar into equipment dispensing sacks of 50-kilograms (kg), 10 kg, and 5 kg capacities.

Beverage manufacturing.—The manufacture of soft drinks, both carbonated and noncarbonated, constitutes the largest segment of the beverage industry. Production totaled 680 million liters in 1970 and 750 million liters in 1972. In the same 2-year period, beer output rose from 400 million liters to 480 million liters; mineral water, 115 million liters to 125 million liters; malt drinks, 48 million liters to 55 million liters; alcoholic beverages, 26 million liters to 35 million liters; and wine, 7 million liters to 7.3 million liters.

Roughly 50% of the sales by all beverage producers are made by the 10 large bottling facilities (those with 500 or more employees) in the country. Capital investment for the industry as a whole is estimated at $8 million to $10 million a year.

The leading manufacturer is Pepsi-Cola de Venezuela. Companies with corporate affiliations to Pepsi-Cola are Hit de Venezuela S.A. and Frescolita de Venezuela, which make soft drinks of various flavors.

The beverage industry is heavily supplied with U.S.-made equipment, and operations are similar to those found in American bottling plants. Management is anxious to automate as much as possible and will incorporate new advanced equipment in future development plans. The large firms have extensive market research programs to increase their sales and introduce new products.

The Coca-Cola bottling plant in Caracas has a system typical of those in the 14 plants the company runs in Venezuela. The capacity of the Caracas plant is 3,000 gal an hour. Pre-inspection is done visually along a conveyor system, after which the bottles are unloaded by machine, cleaned with caustic soda on a mechanical bottle-washer, and then conveyed to the filling machine. A proportioning machine mixes the gas, water, and syrup, and a carbonating machine cools and carbonates the mixture. The filled bottles are inspected visually before being loaded in cases by machine. All of the equipment in the plant is 16 years old.

Dairy products manufacturing.—Milk and dairy foods comprised 15% of the value of all processed food production in 1971. Growth in this industry has been vigorous. Fresh milk production grew at an average rate of 9.7% a year from 1970 to 1972, increasing from 275 million liters to 331 million liters. Cheese output in 1972 was 16,302 MT; butter, 6,290 MT; ice cream 24,000 MT; custards, 3,000 MT; and powdered milk, 54,401 MT.

Although there are 100 producers in the country, eight large ones account for 60% of all sales. Capital expenditures in the dairy industry are estimated at $8 million to $10 million annually.

The Venezuelan Government regards dairy products, particularly fresh and powdered milk, as basic commodities and thus closely controls their prices. Restraints currently in effect have created a cost squeeze for processors, forcing them to postpone planned expansions until the pressures on available capital and market prices have eased. Aside from regulating prices, the Government does not take an active role in the industry. Most of the large dairies have corporate ties with foreign firms.

The largest liquid milk supplier in Venezuela is Industrias Lactea Venezolana C.A. (INDULAC), an affiliate of the Borden and Nestle companies. An affiliate of INDULAC, Industrias Lacteas de Perija C.A. (ILAPECA), produces powdered milk.

Grupo Empresa Club is the holding company for Helados Club, the largest producer of ice cream. This company also controls Concentrados Nacionales (a producer of fruit pulps and juices), Condimix (condiments), and VENSABOR (spices and flavoring).

Within this group, Concentrados Nacionales plans to build facilities to produce ice cream and condiments. No figures on the size or cost of the project have been released, but construction is expected to begin within the next 2 years. Equipment needed will include machines for preparing ice cream, cutting, and coating with chocolate and other flavors. Output of ice cream is expected to be about 120 cases a day. The expansion of condiment production will require pulpers, shredders, grinding and crushing machines, cookers, mixing machines, and bottle fillers.

Expansion is also planned by Productos EFE S.A., the chief competitor of Helados Club. The project, to start in 1975, has a budget of approximately $250,000 for equipment to make ice cream. On the purchase list are pasteurizers, ice cream preparation and freezing equipment, beaters, mixers, homogenizers, blenders, vacuum form/fill/seal systems, and fillers for liquids. With this new equipment, EFE hopes to raise its annual output of ice cream by 10 million liters.

Management in the dairy products manufacturing industry is somewhat conservative. Since the large dairies are branches of multinational corporations, they look to the parent companies for research and development. There is some interest in automation, but change is expected to come slowly.

The ice cream production system in use at the Productos EFE plant in Caracas illustrates the level of technology of large dairy products manufacturing facilities in Venezuela. Raw materials are weighed in, then poured into stainless steel tanks where they are mixed, pasteurized, and homogenized. The ice cream is then cooled to the freezing point, allowed to mature in 9 stainless steel tanks, and then frozen in 14 freezer-mixers. Two machines fill paperboard containers with bulk ice cream, two others fill ice cream cones and other individual portion containers, and four others make ice cream on sticks. The finished products are stored in a freezing room before shipment.

Trade and Technical Regulations

The present Venezuelan customs system, adopted in May 1973, conforms to the classification of the Brussels Tariff Nomenclature. In Venezuela, however, these categories are new, and some confusion still exists about the category in which a given part or machine will be classified. Problems with the new system, coupled with highly congested port facilities, often cause considerable delays in getting items into the country. U.S. suppliers new to this market should contact local customs brokers for help in determining the classification category for their equipment, as well as for guidance on importation procedures.

Under the new customs system, tariff rates on food processing and packaging equipment range from 1% for most types of machinery to as high as 40%. The consular invoice and fee for importation previously imposed have been dropped. Instead, there is now a 3% ad valorem tax in addition to customs duties on all imports. An additional 2% tax is levied on items brought in by parcel post or airfreight.

Further information on duty rates and trade regulations applicable to imports of food processing

Additional Information

This Survey is one of a series based on market research reports prepared overseas for the Office of International Marketing. Current and detailed marketing information on Venezuela to supplement this report is available on a continuing basis from:

Country Marketing Manager—Venezuela
Office of International Marketing
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230
Telephone: (202) 967-2995

A loan copy of the original research is available from:

Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Please request: "The Market for Food Processing and Packaging Equipment in Venezuela", DIB 74-12-536, August 1974.

and packaging equipment may be obtained from the Office of International Marketing, BIC/DIBA, U.S. Department of Commerce, Room 4016, Main Commerce Building, Washington, D.C. 20230.

At present, Venezuela does not have any technical or labeling requirements for imported food processing or packaging equipment. A commission to study and create official standards has been established by the Government—Commission Venezolana de Normas Industriales (COVENIN). The commission is even now developing standards for items of Venezuelan manufacture, which will bear the seal NORVEN, if approved, and will be favored by prospective government purchasers. COVENIN is also working with similar groups from the other Andean Common Market countries in an effort to create jointly recognized standards of quality.

Venezuela's electrical power supply characteristics are 110/220 volts, 60 hertz, 1- or 3-phase. Officially, measurements are all in metric units however the English system of units is generally understood throughout the country, owing to the widespread use of U.S.-made equipment.

Information on the availability of standards for food processing and packaging equipment in Venezuela may be obtained through the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

Country Market Briefs

Abstracts from reports on seven additional country markets for food processing and packaging equipment are contained in this section. The reports were prepared by the U.S. Foreign Service—Department of State in the countries surveyed and contain key data on the markets for food processing and packaging equipment.

The original documents are available from:
Office of Export Development
BIC/DIBA
U.S. Department of Commerce
Washington, D.C. 20230

Belgium

The Belgian market for food processing and packaging equipment is predicted to grow at an average rate of 5% annually during the next 4 years, rising from $393 million[1] in 1974 to almost $480 million in 1978.

Sales of *food processing equipment* are expected to reach $315 million in 1978, up from $258 million in 1974 and $175 million in 1972. Belgium's 1974 food processing equipment imports amounted to $275 million, of which the U.S. share was 8% ($22 million); imports in 1978 should reach $330 million, with purchases from American firms accounting for 10% ($33 million).

The market for *food packaging equipment* is projected to rise from $135 million in 1974 to over $160 million in 1978; sales in 1972 were valued at $95 million. U.S.-manufactured equipment comprised 5% ($7 million) of the $140-million import market in 1974 and should account for 8% ($13.6 million) of $170-million worth of imports forecast for 1978.

Competitive Environment

Approximately 60 Belgian firms manufacture food processing and packaging equipment. Their production in 1973 was valued at $75 million, of which roughly 75% was exported. Though most of the companies are small, several do substantial business, particularly Franck & Van Remoorters S.A., which is one of Europe's major producers of all types of vegetable processing, canning and filling, and packaging equipment. Other major producers include Vickers Vandergeeten (brewing and bottling equipment), Ooms (baking equipment), and Bopack and De Hoop (both makers of packaging equipment). Important manufacturing subsidiaries of U.S. companies operating in Belgium are FMC Food Machinery Europe and FMC Europe (two separate companies), and Crown-Cork Belge.

European suppliers, chiefly from Germany, France, and the Netherlands, provide most of Belgium's imports of food processing and packaging equipment. However, American manufacturers should find increasing sales opportunities as economic uncertainties and rising labor costs spur local interest in plant labor-saving machinery.

The Food Processing Industry

The Belgian food industry has experienced considerable growth in the past few years, due both to increased per capita food consumption at home and a burgeoning export market. The industry comprises some 10,000 companies, but two or three large firms actually dominate each product sector. Value-added production of processed foods rose from just under $2 billion in 1971 to almost $2.2 billion the following year.

Output of some of the industry's major products in 1973 was: beer, 1.5 billion liters; soft drinks and bottled water, 772 million liters; canned meats, 20 million tons; fluid milk, 463 million liters; powdered milk, 129 million tons; butter, 77 million tons; cheese, 35 million tons; ice cream, 58 million tons; chocolate products, 89 million tons; and coffee, 43 million tons.

Belgium's leading processed food item is beer. Four large producers, led by Stella Artois, account for most of the country's output. Recent efforts to introduce non-returnable bottles in the brewing industry have not met with success, but a growing export market might change this, thus creating good sales potential for U.S. bottling equipment makers.

The meat and poultry processing sector is one of the least advanced of Belgium's food industry. Processing beyond the slaughterhouse is largely done by 15 small firms. Although prospects of major equipment purchases in the near future are slight, the industry inevitably will undergo a thorough reorganization, probably sponsored by the national government. On the presumption that such action will be taken, directors of public slaughterhouses in major cities are currently collecting information on butchering and processing equipment for which total orders eventually could be very substantial.

The Belgian dairy industry's increasing production of such specialty items as yogurt, cheese and ice cream will necessitate portion-packaging and freezing equipment purchases. The leading producer in the important local chocolate industry, Cote d'Or, plans construction of new facilities at Halles that also could offer substantial sales opportunities to U.S. equipment suppliers. Additional confectionery producers may well expand operations in the years to come in response to rapidly growing domestic and foreign demand. Other firms actively considering the purchase of U.S.-made equipment include the country's numerous coffee producers. The leading companies in that area are Cafes Jacqmotte S.A., Cafeteria Chat Noir, and Koffie Rombouts.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rate: US$1.00=BF 40.

Finland

U.S. manufacturers of food processing and packaging equipment are expected to substantially improve their competitive position in the Finnish market during the next several years. This assessment by local trade sources is combined with their forecast of strong growth in the market for this equipment—a rise from the 1974 level of $35.8 million [1] to more than $60 million in 1978.

Sales of *food processing machinery* are expected to increase at an average annual rate of nearly 13% from $30.9 million in 1974 to over $50 million in 1978; they stood at $21.9 million in 1972. U.S. producers' 1974 sales of $1.2 million represented 5% of all imported food processing machinery; anticipated sales of $6 million in 1978 should give American firms a 15% share of imports.

The market for *food packaging equipment* is projected to rise from $4.9 million in 1974 to nearly $9 million in 1978, reflecting a growth rate of almost 16% annually. Sales totaled $3.6 million in 1972. American manufacturers captured 18% of the import market for this equipment in 1974, selling a total of nearly $700,000, and should hold a 25% share of imports, or just under $2 million, in 1978.

Competitive Environment

Food processing and packaging equipment manufactured in Finland is limited to a few specific items. The major part of the machinery used in the country comes from abroad, primarily from Germany. Denmark, Sweden and the United Kingdom are also significant sources of supply.

Finnish buyers heretofore have considered U.S.-made equipment to be more expensive than European-made articles and only turned to American companies for specialized items. This attitude is changing, however, due both to currency realignment and to changing industry needs. An upsurge in demand for high-technology equipment such as oven-ready-package making equipment, homogenizers for dairy processing, and demoulding machines for bread, is seen to favor U.S. manufacturers.

The Food Processing Industry

Finland's output of processed foods grew by more than 4% in 1973. Production in that year was valued at $2.5 billion, of which over $95 million was exported. Capital investment by the country's food processors amounted to approximately $130 million. The Government presently is promoting the consolidation of existing facilities and the establishment of new ones in the depressed eastern and northern parts of the country.

Promising sales potential for producers of food processing and packaging equipment exists in Finland's beverage, dairy products, meat, and chocolate and confectionery industries.

Approximately 85% of Finland's total beer output is made by three companies: Mallasjuoma Oy, Sinebrychoff Oy, and Hartwall Oy. The last-named company produces about half the country's soft drinks. Alko Oy makes 90% of the domestically-manufactured liquor; Orion-yhtyma Oy Chymos and Huhtamaki-yhtyma Oy together produce some 60% of the total output of fruit juice, wines, and liqueurs. Huhtamaki-yhtyma Oy plans to invest $7.3 million in cider and apple wine producing facilities, with construction due to begin by the end of 1975. The three leading breweries also reportedly plan expansions.

Manufacture of dairy products has risen only slightly in the last few years. Total output of butter stood at approximately 80 million kilograms (kg) in 1973 and evaporated milk at 87 million kg. Ice cream manufacture is a growing segment of the industry; production in 1973 totaled 35.6 million liters. Valio Meijerien Keskusosuusliike controls 80% of the milk, butter and cheese market in Finland, and 50% of the ice cream market. The company plans to begin construction of two cheese factories by the end of 1975; the total investment is estimated at $4 million.

Production of processed meat products (particularly smoked sausages) and chocolate and confectionery products for export is expected to increase significantly in the years ahead. Exports of processed meats were valued at $4.3 million in 1973; chocolate products, $8.6 million; and confectionery products, $2.9 million. Leading Finnish meat processors include Huhtamaki-yhtyma Oy, Karjakunta, Keskusosuusliike OTK, and Suoven Sokeri Oy. Karl Fazer Oy accounts for 50% of the country's output of chocolates and confections, and Orion-yhtyma Oy Chymos accounts for 20%.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following rate: U.S. $1.00=Fmk 3.82.

Hong Kong

The market for food processing and packaging equipment in Hong Kong is small but offers many specific sales opportunities to U.S. manufacturers. The total value of equipment sold in the colony is predicted to more than double, increasing from its 1974 level of $3.8 million[1] to over $8 million in 1978.

Sales of *food processing equipment* rose from $1.3 million in 1972 to $2.4 million in 1974, reflecting an average annual growth rate of 36%. After 1974, growth of the market is expected to proceed at about 20% annually, with the total value of goods sold in 1978 forecast to reach approximately $5 million. U.S. manufacturers in 1974 supplied 35% of the colony's food processing equipment imports, for a value of slightly more than $800,000, and should account for 40% of imports, or $2 million, in 1978.

Sales of *food packaging equipment* increased more than 40% annually from just over $700,000 in 1972 to $1.4 million in 1974. Future growth is projected to average 22% annually, boosting the market to over $3 million in 1978. Nearly 25% of imported food packaging equipment, or about $750,000 worth, is expected to come from the United States in 1978. Purchases from U.S. suppliers in 1974 totaled $518,000.

Local manufacturers play almost no part in the market for food processing and packaging equipment, and this situation is not expected to change in the near future. Instead, Hong Kong's food processors import their machinery, mostly from Japan, the United Kingdom and the United States.

The Food Processing Industry

Food processing is not a large industry in Hong Kong. It comprised 888 food and beverage manufacturing establishments in 1974, with a total employment of more than 11,000 persons. The industry is expected to grow substantially, however, as supermarkets gain popularity in the colony.

Bakeries account for 50% of all the registered food processing facilities and one-third of the industry's employment. The Garden Company employs nearly 800 persons and has total assets of over $3.5 million. It sells about 80% of the packaged bread and crackers produced in the colony and 10% of the cakes and cookies; its output has risen 10% annually in recent years. The Bakeland Company, which is the only other large baking concern, also has experienced 10% annual growth in its lines of baked goods. Baker-Perkins of the United Kingdom provides the largest share of this industry's equipment needs; German and Italian manufacturers supply a smaller percentage of the market. American companies generally sell such specialized apparatus as hamburger bun making machines.

Twenty-three firms produce beverages in Hong Kong, and together they employ nearly 2,000 workers. Several manufacturers of soft drinks plan to expand their facilities within the next few years. These include A. S. Watson, which is interested in a 320 bottle-per-minute line, and Amoy Canning, which might buy either one or two 600 bottle-per-minute lines. The San Miguel Brewery in Hong Kong is also considering equipment purchases. These companies generally buy either U.S.- or Japanese-made machinery.

Ice cream consumption is growing at an annual rate of over 25% and local manufacturers, principally Dairy Farms and A. S. Watson, will be adding considerable capacity to their plants between 1975 and 1977 to meet the increased demand. Meat processing in Hong Kong is conducted by the Urban Services Department of the metropolitan government, which expects to issue tenders for overhead carcass transport lines sometime after 1975.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1.00=HK$5.64 (1972); HK$5.14 (1973); HK$5.06 (1974 and subsequent years).

Ireland

As Ireland's production of processed foodstuffs increases in response to a growing export market, the food industry must invest heavily in processing and packaging equipment. Total sales of this machinery are expected to rise by an average annual rate of almost 30% from 1974 through 1978—or from approximately $84 million [1] to well over $230 million.

The market for *food processing equipment* grew from $44.6 million in 1972 to more than $74 million in 1974. Sales in 1978 are projected at $205 million, comprised mostly of imported machines. Purchases of U.S.-manufactured equipment totaled $3.1 million in 1974 and are forecast to rise to $8.6 million in 1978.

The market for *food packaging equipment* in Ireland climbed from $6 million in 1972 to $10 million in 1974 and is expected to exceed $28 million in 1978. The value of food packaging machinery imported from the United States is projected to reach $2 million in 1978, up from $714,000 in 1974.

Competitive Environment

The bulk of equipment used by the Irish food processing industry is imported from European manufacturers. Ireland's recent entry into the European Economic Community will give these suppliers a further competitive advantage.

U.S. suppliers heretofore have only held a significant portion of the market for meat processing equipment but are increasing their sales of refrigerating and packaging equipment and machines for the manufacture of dairy products. Trade sources suggest that there could be a considerable upsurge in demand for American-made equipment as Irish food processors move in the direction of high-capacity production.

Domestic manufacturers of food processing and packaging equipment supply little of the Irish market at present but are slowly increasing their share. Local producers of food processing equipment include Golden Vale Engineering, Irish Aluminum Co., Foley and Duffy and Co., Industrial Commodities Corp. Ltd., and Little Island Engineering Ltd., a subsidiary of a Danish company (meat and fruits and vegetables). International Packaging Machinery Ltd., a French-owned firm, produces heat-seal shrink wrapping euipment.

The Food Processing Industry

Food processing is by far the largest Irish manufacturing industry. Gross output of processed foods in 1973 totaled nearly $1.5 billion, and that of drink and tobacco amounted to an additional $400 million. The food, drink, and tobacco industries accounted for over 40% of the gross production of all the country's manufacturers in that year and employed more than 50,000 people, or over 25% of those employed in manufacturing.

The industry's output has risen by an average of almost 6% per year over the last decade. Encouraged by marketing opportunities arising from Ireland's entry into the European Economic Community (EEC), local trade sources predict much higher rates of growth in processed foods production in the coming years.

Meat processing is the largest sector of Ireland's food industry, employing nearly 10,000 persons. Gross output of bacon and pork factories increased from $133.8 million in 1970 to $153.4 million in 1971, and that of other meat processing establishments rose from $154 million in 1969 to $190 million in 1970, the latest years for which statistics are available. Important processors of pork products include Henry Denny and Sons Ltd., Galtee Tendermade Food Products, and Roscrea Meat Products Ltd. Cork Cooperative Marts Ltd., a farmers' cooperative which controls the International Meat Co. and Irish Meat Packers Ltd., is the leading processor of other meat products.

The dairy products manufacturing industry processed $216 million in goods in 1970. Some 220 manufacturing establishments together employ more than 7,000 workers. Large cooperatives dominate the industry. Among the most prominent of these are the North Kerry Co-op, the Waterford Co-op, Avonmere Milk Products Ltd., Mitchelstown Creameries, and Golden Vale Food Products. Premier Dairies of Dublin is the country's largest bottler and distributor of milk.

Brewing, distilling, and soft drink production are expanding sectors of the Irish food processing industry; brewing, with a gross output of $148 million in 1970 and $173 million in 1971, is by far the most important. While there are seven brewing establishments employing a total of 5,000 persons, the Guinness Group accounts for 80% to 90% of total production. Guinness plans to spend some $50 million between 1973 and 1976 to modernize its plant and equipment in Dublin; significant re-equipment will continue at least through 1978.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1.00=Ire£ 40.

Malaysia

Maylasia offers a promising market for manufacturers of food processing and packaging equipment as a result of its continuing expansion of agricultural production to meet both domestic and foreign demands. Sales of such equipment rose from $17.7 million[1] in 1972 to almost $30 million in 1974; they are forecast to advance at an average rate of more than 10% annually during the next four years, reaching $44 million in 1978.

Sales of *food processing equipment* climbed from $15.8 million in 1972 to $28 million in 1974 and are projected to total $41 million in 1978. The market for *food packaging equipment* is expected to reach $3 million in 1978, up from $1.9 million in 1974 and $1.85 million in 1972.

Malaysian food processors depend on foreign suppliers for almost 95% of their annual requirements for both processing and packaging equipment. Machinery purchased from the United States accounted for roughly 12% of the 1972 import market and 20% of 1973 imports. The major foreign sources of supply are Europe and Japan. Malaysian buyers place price above all other considerations in making purchases, and Japanese manufacturers hold the greatest advantage in this regard.

Local production of food processing and packaging equipment is insignificant; only palm oil processing apparatus is presently manufactured in the country. Any other future production will most likely come through licensing or joint venture arrangements with foreign companies, a practice which is encouraged by the Government.

The Food Processing Industry

The Malaysian food processing industry employed in excess of 23,000 persons in 1971 and achieved a total value-added production of almost $75 million. Growth in the industry has been rapid in recent years; output rose 14% in 1973 alone. Although the country exports such items as canned pineapple and animal feed, many other types of food must be imported, so that the national government has intensified its efforts to achieve agricultural self-sufficiency.

Grain milling is one of the most important food industries in Malaysia, accounting for $11.3 million in value-added production by 112 companies in 1971. Approximately 50% of this output is rice. The National Padi and Rice Authority (LPN), a government agency, coordinates various aspects of production, processing and marketing of grains. It owns several milling facilities and plans continued development until the country produces 100% of its rice consumption (Malaysia was approximately 80% self-sufficient in rice in 1973).

Meat processing has heretofore been limited in Malaysia—five firms employed 625 workers in that year. The National Livestock Development Authority (MAJUTERNAK), the government agency responsible for promoting the development of the country's livestock industry, has undertaken the construction of slaughterhouses throughout the country. MAJUTERNAK allocated almost $14 million in 1974-75 for that purpose.

Other areas of expansion in the food industry include the production of palm oil and pineapple. Sixty mills currently process palm oil; the estimated output in 1974 was 158,000 tons. The Federal Land Development Authority (FELDA) plans to construct 23 more plants, using much imported equipment. Four companies now can pineapple, which is an important export item; value-added production in 1971 amounted to over $3 million. Production is promoted by a government agency, The Food Industries of Malaysia Sdn. Bhd. (FIMA), which operates through its subsidiary, the Pineapple Cannery of Malaysia.

LPN, MAJUTERNAK, FELDA, FIMA, MAJUIKAN (The Fisheries Development Authority), FAMA (The Federal Agricultural Marketing Authority), and PMB (The Pepper Marketing Board) are Malaysia's major end-users of food processing and packaging equipment. All of these agencies are implementing development plans in various sectors of the country's food industry. In addition to the projects mentioned in the paragraphs above, MAJUIKAN plans to establish several fish and shrimp processing plants and fishmeal factories; FIMA is considering the establishment of plants to process dessicated coconut and to can fish; and FAMA has plans to process and market cocoa, tapioca, sago, coffee and tea.

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[1] Figures refer to peninsular Malaysia only. All values are shown in U.S. dollars. Local currency data are converted at the following exchange rates: US$1.00=M$3.06 (1971); M$2.82 (1972); M$2.48 (1973 and subsequent years).

Norway

The Norwegian market for food processing and packaging equipment has recovered from the slump it experienced in the early 1970's and is now expected to grow at an average annual rate of 25% during the next several years. Total sales should rise from an estimated $28 million [1] in 1974 to over $67 million in 1978.

Sales of *food processing equipment* in 1972 totaled $13.4 million. They amounted to $16.8 million in 1974 and are expected to grow at an average annual rate of 26%, reaching $42 million in 1978.

The *food packaging equipment* market totaled just over $10 million in 1972 and rose to $11.2 million in 1974. Sales are forecast to increase to over $25 million in 1978, reflecting an average annual growth rate of 22%.

Norway's food processors import the major part of their equipment needs. Purchases from U.S. firms amounted to 4% of all imported processing equipment and 7% of imported packaging equipment in 1972. Demands for high-volume American-made equipment is rising, however, as the Norwegian food industry continues its current trend of amalgamation of smaller plants into large centralized facilities. Food processing equipment purchased from the United States accounted for 10% (or approximately $1.52 million) of imports in 1974, and in 1978 should reach 25% ($9.5 million) of processing equipment imports. U.S.-origin food packaging equipment comprised 20% ($2.1 million) of such imported machinery in 1974, and is expected to account for 35% ($7.7 million) of imports in 1978.

German, Danish and Swedish firms supply the bulk of Norway's imported food processing and packaging equipment. Domestic manufacturers mainly produce dairy and fish processing equipment and packaging, conveying and refrigerating equipment.

The Food Processing Industry

Norway's food processing industry comprised almost 3,300 firms in 1971 and employed about 55,000 persons; 18 companies had 200 or more employees. Total production in that year was valued at $1.6 billion.

The fish and seafood, beverage, and dairy products industries will offer particularly good sales potential to American food processing and packaging equipment manufacturers in the next few years.

In 1971 the country's fishing industry supported some 600 processing plants employing a total of 16,000 persons. Its production was valued at over $361 million, with frozen fish and fish oil and meal each representing about 30% of that figure. The industry is undergoing a period of substantial rationalization in which many small facilities are being consolidated into larger units. Production of fish meal is expected to phase out as processing of consumer products increases.

The beverage industry in 1971 comprised 62 plants employing almost 5,000 persons. Malt liquor accounted for $105 million of the industry's total output of $138 million in that year. Norwegian brewers invest an estimated $7 million annually in equipment and are looking increasingly to the United States for these purchases.

Dairy products were manufactured by 278 plants employing a total of 6,300 persons in 1971. Production amounted to $295 million, almost all of it fluid milk for direct consumption. The dairy industry is soon expected to be making heavy investments in the areas of ice cream and casim milk production.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rate: US$1.00=NKr 7.14.

Thailand

Sales of food processing and packaging equipment in Thailand are projected to rise from approximately \$6.6 million[1] in 1974 to \$10.6 million in 1978, as the country continues modernization and expansion of its food industry. Factors such as the increasing cost of labor and the growing export orientation of Thailand's food processors assure U.S. equipment manufacturers of favorable sales prospects in many areas.

The market for *food processing equipment* grew spectacularly between 1972 and 1974, rising an average of 32% annually. The total value of machines purchased in the earlier year was approximately \$2.7 million; by 1974 the value had grown to \$4.7 million, and it is expected to reach \$8 million in 1978. U.S. firms supplied 20%, or just over \$900,000, of all imported processing equipment in 1974, and their share should rise to 30%, or over \$2 million, in 1978.

Thailand's *food packaging equipment* market has been growing at a much slower rate; between 1972 and 1974 it showed no real growth. Sales in the ensuing four years are projected to grow at an average annual rate of slightly less than 9%, rising from \$1.9 million in 1974 to \$2.6 million in 1978. The U.S. share of food packaging equipment imports is expected to grow from 15%, or \$270,000, in 1974 to 25%, or \$625,000, in 1978.

Competitive Environment

The Thai food processing industry presently purchases much low-priced machinery from Japan and Taiwan. American firms compete with German and Italian manufacturers for sales of more sophisticated items. Equipment made in the United States is considered price competitive with European goods but is only now becoming widely known among Thai end-users.

No local manufacturers specialize in production of food processing and packaging equipment, but many firms fill special orders. No foreign producers of food processing and packaging equipment have manufacturing subsidiaries or licensees in the country.

The Food Processing Industry

Value-added production by Thailand's food processors currently approximates \$100 million per year. The industry employs between 20,000 and 30,000 workers. Agriculture is an important sector of the Thai economy, and the country's Third Five Year Plan provides for increased development of food processing facilities as a first step to realizing the enormous potential export market, particularly in the areas of fruit and seafood.

The sugar, fruit and vegetable, and fish and seafood sectors of Thailand's food processing industry are expected to offer the greatest sales potential to U.S. equipment makers during the next several years.

Some 40 sugar refineries are presently in operation or under construction in Thailand. Despite recent poor harvests caused by drought, production in the 1972-73 season totaled over 717,000 metric tons, up from 585,000 tons in 1971-72. Chief among the sugar producers are Thai Rung Ruang Industries Co. Ltd., Mitrapol Sugar Factory Ltd. Partnership, and Mitrakaset Industry Co. Ltd. Many producers plan to modernize and automate their facilities within the next few years.

Processing of seafood is a major industry in Thailand, almost all of it being in the form of frozen fish and shrimp for export. Such exports in 1972 were valued at \$20 million, two-thirds of which comprised shrimp. Other products include canned fish, fish sauce, and fishmeal for livestock feed. Some principal seafood processors are Thai Seree Cold Storage, Sinhu Cold Storage, Thai Marine Food Co. Ltd., and Seafood (Thailand) Ltd. The last of these, a new company owned partly by Australian interests, is currently installing a fish canning operation.

The fruit and vegetable processing industry holds promise of considerable growth as Thai companies explore the export potential for pineapples and other products. Pineapple canning for export has only developed since 1967, but the installed capacity of the seven factories now in operation comes to 380,000 tons of product. Although the industry presently is overbuilt, future expansion is considered most likely. Thai Pineapple Canning Industry Co. Ltd., Siam Food Products, and Dole (Thailand) Ltd. all specialize in pineapple processing.

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[1] All values are shown in U.S. dollars. Local currency data are converted at the following exchange rate: US\$1.00=B20.

U.S. Government Services Available To American Exporters

MARKETING ASSISTANCE AND INFORMATION SERVICES

Foreign Promotional Events

The Department of Commerce sponsors a variety of promotional events designed to assist American firms and their representatives in developing export markets. Organized and staged by the Office of International Marketing (OIM), the events listed below are utilized by U.S. exporters to penetrate new markets, increase sales, and find foreign agents and distributors for their products.

- U.S. Trade Center Exhibitions
- Solo Exhibitions
- M1 Presentations
- Joint Export Establishment Promotions (JEEPs)
- Specialized U.S. Trade Missions
- Technical Sales Seminars
- Catalog Exhibitions
- Commercial Fairs

A description of the above and a schedule of 1975 and 1976 events suitable for promoting exports of food processing and packaging equipment begins on page 148. Non-U.S. sponsored events also are listed.

U.S. Trade Promotion Facilities Abroad

U.S. trade promotion facilities abroad provide U.S. manufacturers with a unique method of testing and selling in key foreign markets through commercial show rooms established in central marketing areas where the potential for American products is continuous. The Trade Development Office in Warsaw, however, does not have exhibit facilities.

Information on exhibitions at U.S. trade promotion facilities abroad may be obtained from the Country Marketing Managers or the Commerce district offices listed on the following pages.

Listed below are the 17 U.S. trade promotion facilities located in major cities in Europe, Asia, Australia and Latin America.

AUSTRALIA—U.S. Trade Center
37 Pitt Street
Sydney NSW 2000

AUSTRIA—U.S. East-West Trade Center
Prinz Eugen Strasse 8-10
A-1040
Vienna

FRANCE—U.S. Trade Center
123 Avenue Charles de Gaulle
92200 Neuilly
Paris

GERMANY—U.S. Trade Center
Bockenheimer Landstrasse 2-4
D-6000 Frankfurt/Main

IRAN—U.S. Trade Center
Queen Elizabeth II Boulevard
and Kh. Attarzadeh
Tehran

ITALY—U.S. Trade Center
Via Gattamelata 5
20149 Milan

JAPAN—U.S. Trade Center
Tameike Tokyu Building
1-14 Akasaka, 1-Chome
Minato-Ku
Tokyo 107

American Merchandise Display Center
Sankei Kaikan Building
27, Umeda-Cho, Kita-Ku
Osaka

KOREA—U.S. Trade Center
American Embassy
82 Sejon-Ro
Seoul

LEBANON—U.S. Trade Center
American Embassy
Ali Reza Building
Corniche at Avenue de Paris
Beirut

MEXICO—U.S. Trade Center
Liverpool No. 31
Mexico 6, D.F.

POLAND—U.S. Trade Development and Techcal Information Office
Ulica Wiejska 20
Warsaw

SINGAPORE—U.S. Trade Center
268 Orchard Road
Yen San Building
Singapore 9

SWEDEN—U.S. Trade Center
Vasagatan 11
Stockholm

TAIWAN—U.S. Trade Center
Nanking East Road
Taiwan Glass Co. Bldg.
Taipei

UNITED KINGDOM—U.S. Trade Center
4/5 Langham Place
London W1

U.S.S.R.—U.S. Commercial Office in Moscow
c/o American Embassy
Department of State
Washington, D.C. 20520

Country Consultants

Country Marketing Managers (CMMs) provide U.S. firms with marketing information by specific country, counseling on the preparation of effective marketing plans, aids in selecting best opportunity. markets, and assistance in participating in Commerce trade promotion activities. The CMM also can assist in obtaining other foreign business information available within the U.S. Government.

Popular among American businessmen seeking up-to-date marketing information are these publications available through Country Marketing Managers:

- *Overseas Business Reports* cover marketing and "doing business" information, economic data, and trade statistics in specific countries. Approximately 70 reports are issued annually.
- Articles in *Commerce Today,* the Commerce biweekly magazine, contain reports on economic trends, trade developments, and Commerce-sponsored trade events.
- *Global Market Surveys* condense the findings of field research conducted in 20-25 of the best country markets. See Preface for a listing of available titles and the section, Global Marketing Program, for themes scheduled for attention during 1975-77.
- *Country Market Surveys* are separate printed releases of the individual country reports included in Global Market Surveys.
- Comprehensive country surveys illuminate the factors creating sales opportunities in market sectors in subject countries. They discuss growth by industry sector and the demand for U.S. capital goods over the next 5 years. The first comprehensive report, *Brazil: Survey of U.S. Export Opportunities,* is now available, while reports on Nigeria and Venezuela are in preparation and scheduled for release in late 1975.
- Special reports are prepared on timely opportunities and developments. Typical of these are: *Impact of Currency Realignment on U.S. Exports to Germany* (1973), *The Market for Selected U.S. Capital Goods in Ecuador and Peru* (1975), *The Australian Market for U.S. Consumer Goods* (*1975*), and *A Report on the International Market for U.S. Consumer Goods* (in preparation).

In addition, Country Marketing Managers receive an enormous quantity of information, both published and unpublished, on their countries. This data comes from private and public sources, American and foreign. It includes periodic reports received from the commercial sections of U.S. Embassies on selected industries or product categories, "best prospects" for sales in the coming year, and new developments and oportunities of special interest to the U.S. business community.

The Country Marketing Manager provides guidance and direction in commercial activities to the U.S. Foreign Service—Department of State, Trade Center Staffs, Commercial Fairs staffs, and other trade promotion personnel. This includes the planning and implementation of trade promotional activities listed earlier ("Foreign Promotional Events") within the respective country or countries. The CMM is the focal point in Commerce for the development and implementation of the annual Country Commercial Program, jointly prepared by Commerce and the Foreign Service. This operational planning document establishes objectives and priorities for U.S. Government trade promotion and support of U.S. business by country, and the actions to be undertaken to achieve them.

For further information and assistance on marketing in any of these countries, please call or write the appropriate manager. These key contacts may be reached by writing to:

Country Marketing Manager—(specify area)
U.S. Department of Commerce
Washington, D.C. 20230

or by dialing (202) 967—plus the listed extension:

Area	**Extension**
BUREAU OF INTERNATIONAL COMMERCE	
Office of International Marketing	
Africa	
Central Africa	3904
East and Southern Africa	4927
West Africa	4388
Europe and Canada	
Canada and Benelux Countries	3848
France	4504
Austria and West Germany	4414
Italy and Greece	3944
Nordic Countries	4601
Spain and Portugal	3957
Switzerland, Yugoslavia and Turkey	2795
United Kingdom	3713
Far East	
Australia and New Zealand	3646
East Asia	5401
Japan	2427
South Asia	3137
Southeast Asia	3875
Latin America	
Andean countries	2995
Argentina, Paraguay and Uruguay	2428
Brazil	5427
Caribbean countries	4463
Mexico, Central America and Panama	5020

Commerce Action Group for the Near East

Africa, Northern	5737
Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, People's Democratic Republic of Yemen, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen Arab Republic	5767
Egypt, Iran and Israel	3752

BUREAU OF EAST-WEST TRADE

Office of East-West Trade Development

Eastern Europe	2645
USSR	4655
Peoples' Republic of China	2420

Export Information Services

The export information services described below can be obtained by contacting the U.S. Department of Commerce, Office of Export Development, Export Information Division, Room 1033, Washington, D.C. 20230, or the nearest of the Department's 43 district offices (listed following this section). Recently modernized data handling and retrieval techniques now make many services available in a fraction of the time previously necessary.

Trade Lists

Names and addresses of foreign distributors, agents, purchasers, and other firms are made available to U.S. firms through a series of trade lists. *Target Market Trade Lists* are published by country on each Global Market Survey theme (see Preface). *Business Firms Trade Lists* cover all commercial establishments in smaller developing countries. *State Trading Organizations Trade Lists* name and describe government-controlled foreign trade organizations in non-market economy countries.

World Traders Data Reports

World Traders Data Reports (WTDR's) provide descriptive background information on specific foreign firms. Prepared by the U.S. Foreign Service, the WTDR's include such information as year of establishment, method of operation, lines handled, size of sales territory, name of chief executive, general reputation in trade and financial circles, names and addresses of credit sources, names of the firm's connections, and other commercial information. The complete name, street and city address of the foreign firm must be given when requesting this service. Nominal fee.

Agent/Distributor Service

The Commerce Department's Agent/Distributor Service helps U.S. firms find agents or distributors for their products in almost every country of the world. U.S. Foreign Service Officers overseas will identify up to three foreign firms that express interest in a specific U.S. proposal. The charge for this service is $25.

Application forms (DIB-424P) may be obtained from any Commerce Department district office.

Export Mailing List Service

The Export Mailing List Service (EMLS) provides lists of foreign firms considered prospective customers for U.S. firms. Firms are drawn from the automated Foreign Traders Index. Their names and addresses are available on gummed mailing labels or in standard printout form. Printouts also include: Name and title of an officer, type of organization, year of establishment, relative size, number of employees and salespersons, and product and/or service codes (Standard Industrial Classification numbers).

A nominal "set-up" charge also covers the first 300 entries retrieved. Beyond 300, a small additional cost per name is charged. Delivery can be made in about 15 days.

Foreign Traders Index (FTI) Data Tape Service

This service is offered as a convenience to firms that have a continuing need for a broad range of foreign commercial data, such as export management firms selling a wide range of products. This service provides, in magnetic tape form, information on all firms in one or more countries covered in the Foreign Traders Index. Users may thus retrieve various segments of FTI data by running tapes through their own computer facilities. There is a flat fee for this service on a per-country basis for up to 15 countries. A single, fixed charge is made for a package of 15 or more countries or for the entire file.

Overseas Business Opportunities

The overseas business opportunities services described below can be obtained by contacting the U.S. Department of Commerce, Office of Export Development, Overseas Business Opportunities Division, Room 2323, Washington, D.C. or the nearest of the Department's 43 district offices.

Trade Opportunities Program

The Trade Opportunities Program (TOP) receives up-to-date trade leads from over 200 U.S. Foreign Service posts around the world daily and disseminates them to U.S. suppliers. Trade opportunities are based on inquiries by overseas companies that wish to purchase American products or services, or who are interested in representing U.S. firms. Trade opportunities may come from private commercial organizations, from foreign governments, or even from multinational organizations such as NATO or the UN.

To register for TOP, U.S. firms are requested to specify their product and country interests and the types of commercial information desired—direct sales, representation, and/or foreign government tenders. As leads are developed by the Foreign Service, they are cabled to Washington; where they are matched by computer against the criteria established by U.S. companies. These leads are then mailed to appropriate U.S. firms within a week of their origination overseas. Trade leads are charged against prepaid subscriptions.

Overseas Product Sales Group

The Overseas Product Sales Group (OPS) provides personalized assistance to TOP subscribers, or to firms identified as having high export capability, in bidding against foreign competitors for specific export sales opportunities with a value of $1 million or more. The OPS specialists collect, inventory and disseminate early information on export sales opportunities from TOP and a variety of other sources.

Foreign Investment Services Staff

The Foreign Investment Services Staff (FISS) is the focal point for American and foreign business inquiries relating to U.S. investment and licensing abroad. American businessmen are assisted in locating potential overseas licensees and partners, are provided with investment data on specific regions and countries, and then guided toward sources of capital for these proposed projects. Foreign investment and licensing proposals for which U.S. participation and technology is sought are published regularly in *Commerce Today* and are brought to the direct attention of American firms where appropriate. In carrying out its broad range of activities, FISS works closely with other U.S. Government assistance sources, multinational agencies and private regional investment organizations.

Office of Export Administration

Information on U.S. export control may be obtained from the U.S. Department of Commerce, Bureau of East-West Trade, Office of Export Administration, Washington, D.C. 20230. Telephone: (202) 967-4811.

Commerce District Offices

The 43 U.S. Department of Commerce district offices listed below represent the Department in their respective localities and assist in carrying out the programs of the Department. Under the direction of the Office of Field Operations, these district offices are staffed by experienced specialists prepared to help in the solution of business problems and to assist in exporting. In-depth counseling services also are provided at Commerce's Washington offices.

ALBUQUERQUE, NEW MEXICO 87101
U.S. Courthouse—Room 316
Area Code 505 Tel. 766-2386

ANCHORAGE, ALASKA 99501
Hill Building
Suite 412
632 Sixth Avenue
Area Code 907 Tel. 265-4597/8

ATLANTA, GEORGIA 30309
Suite 523, 1401 Peachtree St., N.E.
Area Code 404 Tel. 526-6000

BALTIMORE, MARYLAND 21202
415 U.S. Customhouse
Gay and Lombard Streets
Area Code 301 Tel. 962-3560

BIRMINGHAM, ALABAMA 35205
Suite 200-201
908 South 20th Street
Area Code 206 Tel. 325-3327

BOSTON, MASSACHUSETTS 02116
10th Floor, 441 Stuart Street
Area Code 617 Tel. 223-2312

BUFFALO, NEW YORK 14202
910 Federal Building
111 West Huron Street
Area Code 716 Tel. 842-3208

CHARLESTON, WEST VIRGINIA 25301
3000 New Federal Office Building
500 Quarrier Street
Area Code 304 Tel. 343-6181, Ext. 375

CHEYENNE, WYOMING 82001
6022 O'Mahoney Federal Center
2120 Capitol Avenue
Area Code 307 Tel. 778-2151

CHICAGO, ILLINOIS 60603
Room 1406
Mid-Continental Plaza Bldg.
55 E. Monroe Street
Area Code 312 Tel. 353-4450

CINCINNATI, OHIO 45202
8028 Federal Office Building
550 Main Street
Area Code 513 Tel. 684-2944

CLEVELAND, OHIO 44114
Room 600, 666 Euclid Avenue
Area Code 216 Tel. 522-4750

COLUMBIA, SOUTH CAROLINA 29204
Forest Center
2611 Forest Drive
Area Code 803 Tel. 765-5345

DALLAS, TEXAS 75202
Room 3E7, 1100 Commerce Street
Area Code 214 Tel. 749-1515

DENVER, COLORADO 80202
Room 161, New Customhouse
19th and Stout Streets
Area Code 303 Tel. 837-3246

DES MOINES, IOWA 50309
609 Federal Building
210 Walnut Street
Area Code 515 Tel. 284-4222

DETROIT, MICHIGAN 48226
445 Federal Building
Area Code 313 Tel. 226-3650

GREENSBORO, NORTH CAROLINA 27402
203 Federal Building
West Market Street, P.O. Box 1950
Area Code 919 Tel. 275-9111, Ext. 345

HARTFORD, CONNECTICUT 06103
Room 610-B, Federal Office Building
450 Main Street
Area Code 203 Tel. 244-3530

HONOLULU, HAWAII 96813
286 Alexander Young Building
1015 Bishop Street
Area Code 808 Tel. 546-8694

HOUSTON, TEXAS 77002
1017 Federal Office Building
201 Fannin
Area Code 713 Tel. 226-4231

INDIANAPOLIS, INDIANA 46204
Room 355, Federal Office Building
46 East Ohio Street
Area Code 317 Tel. 269-6214

KANSAS CITY, MISSOURI 64106
Room 1840, 601 East 12th Street
Area Code 816 Tel. 374-3142

LOS ANGELES, CALIFORNIA 90024
11201 Federal Building
11000 Wilshire Blvd.
Area Code 213 Tel. 824-7591

MEMPHIS, TENNESSEE 38103
Room 710, 147 Jefferson Avenue
Area Code 901 Tel. 534-3213

MIAMI, FLORIDA 33130
Room 821, City National Bank Building
Area Code 305 Tel. 350-5267

MILWAUKEE, WISCONSIN 53203
Straus Building
238 West Wisconsin Avenue
Area Code 414 Tel. 224-3473

MINNEAPOLIS, MINNESOTA 55401
306 Federal Buildnig
110 South Fourth Street
Area Code 612 Tel. 725-2133

NEWARK, NEW JERSEY 07102
Gateway Building (4th Floor)
Area Code 201 Tel. 645-6214

NEW ORLEANS, LOUISIANA 70130
International Trade Mart, Room 432
2 Canal Street
Area Code 504 Tel. 589-6546

NEW YORK, NEW YORK 10007
41st Floor, Federal Office Building
26 Federal Plaza, Foley Square
Area Code 212 Tel. 264-0634

PHILADELPHIA, PENNSYLVANIA 19106
9498 Federal Building
600 Arch Street
Area Code 215 Tel. 597-2850

PHOENIX, ARIZONA 85004
508 Greater Arizona Savings Bldg.
112 North Central Ave.
Area Code 602 Tel. 261-3285

PITTSBURGH, PENNSYLVANIA 15222
431 Federal Building
1000 Liberty Avenue
Area Code 412 Tel. 644-2850

PORTLAND, OREGON 97205
Suite 501, Pittock Block
921 S.W. Washington Street
Area Code 503 Tel. 221-3001

RENO, NEVADA 89502
2028 Federal Building
300 Booth Street
Area Code 702 Tel. 784-5203

RICHMOND, VIRGINIA 23240
8010 Federal Building
400 North 8th Street
Area Code 804 Tel. 782-2246

ST. LOUIS, MISSOURI 63103
Chromalloy Building
120 South Central Avenue
Area Code 314 Tel. 622-4243

SALT LAKE CITY, UTAH 84138
1201 Federal Building
125 South State Street
Area Code 801 Tel. 524-5116

SAN FRANCISCO, CALIFORNIA 94102
Federal Building, Box 36013
450 Golden Gate Avenue
Area Code 415 Tel. 556-5860

SAN JUAN, PUERTO RICO 00902
Room 100, Post Office Building
Area Code 809 Tel. 723-4640

SAVANNAH, GEORGIA 31402
235 U.S. Courthouse & Post Office Building
125-29 Bull Street
Area Code 912 Tel. 232-4321, Ext. 204

SEATTLE, WASHINGTON 98109
Room 706, Lake Union Building
Area Code 206 Tel. 442-5615

FINANCING EXPORT SALES

The Export-Import Bank of the United States (Eximbank) is an independent agency of the U.S. Government which works directly with American suppliers and private financial institutions to finance U.S. export sales. Eximbank has numerous financing programs to assist U.S. firms. These include direct loans, bank guarantees, discount loans to commercial banks, leasing guarantees, and other programs to cover overseas design and engineering studies.

Financing packages for major industrial projects and exports of high value products are normally supported under Participation Financing, a combination of the Direct Loan and Financial Guarantee programs.

Direct Loans are dollar credits extended by Eximbank to borrowers outside the United States for purchases of U.S. goods and services. Disbursements under the loan agreement are made in the United States to the suppliers of the goods and services, and the loans, plus interest, are repaid in dollars by the borrowers.

Eximbank will extend its Financial Guarantee to cover loans made by U.S. financial institutions to foreign government or private purchasers of U.S. goods and services. The Financial Guarantee will unconditionally guarantee repayment by a borrower of up to 100% of the outstanding principal due on such loans plus interest equal to the U.S. Treasury rate for similar maturities, plus 1% per annum on the outstanding balances of the loan. Comparable guarantees are available to non-U.S. financial institutions under somewhat different terms.

Of particular importance to U.S. businessmen is Eximbank's Cooperative Financing Facility program which supports medium-term financing in all major markets. Eligible overseas banks are extended a line of credit for half the funds needed for each transaction, presently at 8% interest, and the cooperating banks provide the other half at local market rates. These banks make credit judgments regarding the customer and can consummate transactions with a minimum of difficulty. Eximbank currently has established approximately 300 such working arrangements with foreign financial institutions (private and public) in over 100 countries.

Eximbank's Commercial Bank Exporter Guarantee program, another activity of special interest to exporters, provides guarantees covering the credit and political risks of non-payment of medium-term (181 days to 5 years) export debt obligations purchased by U.S. banking institutions on a non-recourse basis from the exporters. The fee charged for Eximbank's guarantee depends upon (1) the classification accorded the country of import, (2) the length of the repayment terms, and (3) the financial condition of the overseas buyer.

As a general rule, all transactions supported by Eximbank must include a minimum 10% cash payment by the buyer and must have reasonable assurance of repayment.

The Bank is directed by statute to supplement and encourage private capital, not compete with it. Selected product lines and services to designated markets are excluded from the agency's support; however, the overwhelming majority of U.S. export products and markets are covered. Details on the exceptions are available from U.S. commercial banks or directly from Eximbank.

Businessmen are specifically invited to utilize Eximbank's counseling services for exporters, banks and financial institutions seeking financing for U.S. exports. The services include information on the availability of financing within the United States and abroad, as well as on each of the pertinent Eximbank programs.

For additional information, contact the Export-Import Bank of the United States, 811 Vermont Avenue, N.W., Washington, D.C., 20571, or Telex 89-461.

EXPORT CREDIT INSURANCE

The Foreign Credit Insurance Association (FCIA) is an association of 53 stock and mutual insurance companies in partnership with the Export-Import Bank of the United States. It offers a comprehensive selection of credit insurance policies which protect policy holders against loss from failure to receive payment from foreign buyers.

The benefits of this coverage may be summed up as follows:

- It protects the exporter against the failure of the buyer to pay his dollar obligations for commercial or political reasons.
- It enables the exporter to offer foreign buyers competitive terms of payment.
- It supports the exporter's prudent penetration of higher risk foreign markets.
- It gives the exporter greater financial liquidity and flexibility in administering his foreign receivables portfolio.

Who May Be Insured

Virtually any corporation, partnership or individual doing business in the United States is eligible for FCIA coverage. An exporter may apply for a policy for himself or may become insured under the blanket policy of a bank or other financial institution which holds an FCIA policy.

Eligible Products

Foreign sales of all types of industrial, agricultural, and commercial products produced in the United States and of services rendered by U.S.-based personnel are eligible for FCIA insurance.

What Losses Are Covered

Comprehensive FCIA policies protect insureds against non-payment of receivables due to unforeseeable commercial and political occurrences. Commercial risks which are covered include insolvency of the buyer or protracted defaults which may well arise from economic deterioration in the buyer's market area, shifts in demands, unanticipated competition, tariffs, or technological changes. Also covered are defaults due to such buyer problems as increasing expenses, the loss of key personnel, and natural disasters.

Political risk coverage applies to defaults due to governmental action and to political disturbances such as war, revolution, and insurrection. Such events may result in confiscation of the buyer's assets, detention or diversion of shipments, or cancellation of necessary licenses by the United States or by the buyer's country. Also covered is the inability or refusal of the foreign central bank involved to convert the buyer's currency to dollars. Political coverage alone is available for exporters who desire to assume their own commercial risks.

The Policies

The policies offered by FCIA are many and varied. They can be tailored to suit the needs of the individual exporters, service groups, and financial institutions. Aside from a small application fee, all premiums are paid only for goods actually shipped.

The Master Policy combines a deductible provision, discretionary credit authority and once-a-year reporting to provide qualified exporters with lower premiums, independent credit decisions, faster services to overseas buyers, and less paperwork. It is a blanket policy which requires the exporter to insure all or a reasonable spread of his exportation.

The Short-Term Policy is a blanket policy which covers sales on terms of up to 180 days. It provides coverage of 90% for commercial losses and 95% for political losses. A moderate discretionary credit limit is included for each buyer.

The Medium-Term Policy provides 90% coverage (political and commercial) for capital and quasi-capital goods sold on terms of 181 days to 5 years. The policy is written on a case-by-case basis so an exporter need not insure all his medium-term transactions as he would under a blanket policy.

The Combination Policy provides short- and medium-term insurance to protect U.S. exporters in transactions with overseas dealers and distributors. It includes flexible coverage for short-term sales and for both inventory and receivable financing.

The Comprehensive Services Policy insures the receivables generated by the performance of services for foreign customers by U.S.-based personnel, or by U.S. personnel temporarily assigned overseas. Industries benefitting from this coverage include management consultants, engineering and related construction consulting services, and transportation companies.

Special Coverage Endorsements are available in addition to the above policies. These include endorsements to cover specified preshipment risks and consignment selling.

An Aid to Financing

FCIA does not finance export sales. However, the exporter who insures his accounts receivable against commercial and political risks is usually able to obtain financing from commercial banks and other lending institutions at lower rates and on more liberal terms than would otherwise be possible.

Prequalification of Buyers

FCIA's rapidly expanding prequalifying (P.Q.) program is now providing credit information on overseas buyers through its computerization data system. All the exporter needs to do is telephone the nearest FCIA office to determine whether a particular buyer is prequalified for the amount of his purchase.

Information about FCIA

More information about FCIA's services, and applications for policies, may be obtained through insurance agents or brokers or through FCIA's network of full-service regional offices. General questions and specific inquiries may be directed toward the FCIA Ombudsman in the New York office. Call (212) 432-6216 for a direct connection.

FCIA Offices

One World Trade Center—9th Floor
New York, New York 10048
Phone: (212) 432-6200

Suite 1003—William-Oliver Bldg.
32 Peachtree Street, N.W.
Atlanta, Georgia 30303

Suite 1552
10 South Riverside Plaza
Chicago, Illinois 60606

Suite 1315
55 Public Square
Cleveland, Ohio 44113

Suite 1790
611 West Sixth Street
Los Angeles, California 90017

Suite 1110—First Federal Bldg.
700 North Water Street
Milwaukee, Wisconsin 53202

C & I Bldg.—Suite 1408
1006 Main Street
Houston, Texas 77002

Suite 205
1 Embarcadero Center
San Francisco, California 94111

Woodward Bldg., Suite 420
15th & H Streets, N.W.
Washington, D.C. 20005

Trade Promotional Events

The schedule of promotional events for 1975 and 1976 lists appropriate activities for promoting sales of food processing and packaging equipment to overseas customers.

The Schedule provides a chronological listing, by country, covering the following types of promotional activities:

- **International Trade Fairs**—Privately sponsored, foreign managed, international exhibitions in which U.S. firms may exhibit their products on an individual basis.
- **Conferences, Congresses, Seminars and Symposia**—Privately sponsored, international activities in which U.S. firms may participate on an individual basis. Some of these events are held in conjunction with international trade fairs; others are held independently.
- **Trade Center Exhibits**—U.S. manufacturers of specific products with prime market prospects and identified end-users are drawn together at U.S. trade promotion facilities abroad, backed up by intensive promotion campaigns to attract the right buying audience.

Information for all the listed events is, of course, subject to change and should be verified with sponsors or contacts. Some of the earlier events may be closed to additional participants by the time this Survey is published; information on these events will, however, be helpful to those wishing to attend or to arrange for participation in future occurrences of events held periodically.

Events sponsored by or participated in by the U.S. Department of Commerce appear in boldface letters on the Schedule.

Additional Commerce-sponsored promotional activities may be scheduled from time to time. These include:

- **Solo Exhibitions**—Export promotions planned, mounted and managed by the U.S. Department of Commerce in markets that offer promising export sales opportunities but which do not afford regularly scheduled fairs for the display of U.S. products to be promoted.
- **Commercial Fairs**—Commerce-sponsored exhibitions of U.S. products of high sales potential, usually of a major single industry, staged in important international trade fairs.
- **Specialized U.S. Trade Missions**—U.S. Department of Commerce organizes and sponsors Trade Missions covering selected product themes based on available market research and Foreign Service recommendations; Commerce establishes the overseas itinerary, pays the Mission's operating expenses, and provides an Advance Officer and a Mission Director.
- **M1 Presentations**—Single U.S. company product or service promotions in U.S. Trade Centers (see listing on page 140), sponsored, organized and conducted by the companies themselves or their representatives abroad.
- **Joint Export Establishment Promotions (JEEPS)**—Tailor-made promotions designed to help small groups of U.S. manufacturers of related products to inexpensively penetrate new markets on a shared-cost basis.
- **Technical Sales Seminars**—These events, aimed at high technology markets, combine practical panel discussions by U.S. technology experts with individual private appointments. Additionally, these teams of U.S. industrial representatives on multi-country itineraries receive U.S. Foreign Service briefings, tour local installations, and conduct sales interviews, according to each represented company's marketing objectives.
- **Catalog Exhibitions**—Special displays of company catalogs, usually of a single industry, to test markets, develop sales leads, and locate agents and distributors.

For further information regarding events sponsored by or participated in by the U.S. Department of Commerce, contact any one of the 43 Commerce district offices, or the Country Marketing Manager. Additional information on all other events may be obtained from the contact indicated in the Schedule of Events for the particular activity.

Schedule of Promotional Events 1975-1976

EVENTS	1975	1976
AUSTRALIA		
ANPAC—EXHIBITION OF THE NATIONAL PACKAGING ASSOCIATION OF AUSTRALIA Location: Exhibition Buildings, Melbourne Sponsor: National Packaging Association of Australia, 370 St. Kilda Road, Melbourne, Victoria 3004 Frequency: Annual	May	May
MEAT AND ALLIED TRADES FAIR Location: RAS Showgrounds, Sydney Sponsor: Meat and Allied Trades Federation of Australia, 33-35 Pitt Street, Sydney, N.S.W. 2000 Frequency: Biennial		March
PACKPRINT '76—INTERNATIONAL PACKAGING AND PRINTING EXHIBITION Location: RAS Showgrounds, Sydney Sponsor: National Packaging Association of Australia, 370 St. Kilda Road, Melbourne, Victoria 3004, and Printing and Allied Trades Employees Federation of Australia Frequency: Every six years		May 31-June 4
BELGIUM		
"FOOD BUSINESS"—FOOD INDUSTRY TRADE FAIR Location: Centre Internationale Rogier, Brussels Sponsor: Sogestor S.P.R.L., rue Duquesnoy 14, 1000 Brussels Frequency: Annual	January 12-16	January
FOOD AND DOMESTIC EQUIPMENT TRADES FAIR Location: Palais du Centenaire, Brussels Sponsor: S.I.M.P.A., 29 boulevard du Jardin Botanique, B-1000 Brussels Frequency: Annual	October 4-19	October 2-17
INTERNATIONAL FOOD EXPOSITION Location: Centre Nationale du Batiment, Antwerp Sponsor: Exporama, 8 de Roest d'Alkemadelaan, B-2600 Berchem	December 6-14	
EUROBEEF—EUROPEAN PROFESSIONAL FAIR FOR MEAT PROCESSING AND PACKAGING MACHINERY Location: Palais du Centenaire, Brussels Sponsor: CEMA, 52 rue du Progress, 1000 Brussels Frequency: Triennial		February

EVENTS	1975	1976
PROPAK—INTERNATIONAL PACKAGING SHOW Location: Palais du Centenaire, Brussels Sponsor: Foire Internationale de Bruxelles, Palais du Centenaire, B-1020 Brussels		May
BRAZIL		
FIRST INTERNATIONAL MECHANICAL ENGINEERING, ELECTRO-ELECTRONIC TRADE FAIR Location: Anhembi Exhibition Hall, Sao Paulo Sponsor: Sindicato da Industria de Maquinas do Estado de Sao Paulo, Viatudo Dona Paulina, 80-15th andaz, Sao Paulo, S.P. Contact: Alcantara Machado, Comercio e Emprendimentos Ltda., Rua Brasilio Machado, 60, 01230 Sao Paulo, S.P.	November 20-30	
NATIONAL MECHANICAL TRADE FAIR, and ELECTRONIC TRADE FAIR Location: Anhembi Exhibition Hall, Sao Paulo Sponsor: Sindicato da Industria de Maquinas do Estado de Sao Paulo, and Sindicato da Industria de Aparelhos Electricos, Electronicos e Similares do Estado de Sao Paulo Contact: Alcantara Machado, Comercio e Emprendimentos Ltda., Rua Brasilio Machado, 60, 01230 Sao Paulo, S.P. Frequency: Biennial		June/ July
CANADA		
ONTARIO FOOD PROCESSORS ASSOCIATION ANNUAL CONFERENCE Location: Toronto Sponsor: Ontario Food Processors Association, Suite 309, Ontario Food Terminal, Toronto, Ontario, M8Y 1HB Frequency: Annual	November 23-25	November
BAKERY PRODUCTION SHOW OF ONTARIO, INCORPORATED Location: Skyline Hotel, Toronto Sponsor: Bakery Production Club of Ontario Contact: P. Newell, c/o General Foods Ltd., 2200 Yonge Street, Toronto 7, Ontario Frequency: Biennial		November 3-5
FINLAND		
HELSINKI INTERNATIONAL TECHNICAL FAIR Location: Helsinki International Fair Center, Helsinki Sponsor: Finnish Fair Corporation, PL 22, 00251 Helsinki 25 Frequency: Biennial	September	

EVENTS	1975	1976
HELSINKI INTERNATIONAL MATERIALS HANDLING EQUIPMENT EXHIBITION Location: Ice Hall, Helsinki Sponsor: Finnish Society for Transport Economy, Katajanokankata 5.0., 00160 Helsinki 16 Frequency: Triennial		May
FRANCE		
OYSTER AND MUSSEL PRODUCTION EQUIPMENT EXHIBITION Location: Exhibit Hall, La Tremblade Contact: French Trade Shows, 1350 Avenue of the Americas, N.Y. 10019 Frequency: Annual	April	April
INTERSUC — INTERNATIONAL CONFECTIONERY, CHOCOLATE AND BISCUIT TRADE EXHIBITION Location: Parc des Expositions, Paris Contact: French Trade Shows, 1350 Avenue of the Americas, N.Y. 10019 Frequency: Annual	April 5-9	April
FOOD PROCESSING, PACKAGING AND PRINTING EQUIPMENT TRADE CENTER EXHIBITION Location: U.S. Trade Center, Paris Sponsor: U.S. Department of Commerce		June 7-11
INTERAL—INTER ALIMENTATION Comprising the folowing separate exhibitions: International Food Industries Equipment Exhibition International Packaging Exhibition MATIC—International Exhibition of Machinery and Techniques for the Meat Industry and Trade International Show of Bottling and Brewing Industries International Food Products Exhibition Location: Parc des Expositions, Paris Contact: French Trade Shows, 1350 Avenue of the Americas, N.Y. 10019 Frequency: Biennial		November
GERMANY		
ISM—INTERNATIONAL SWEETS AND BISCUITS FAIR Location: Cologne Sponsor: Messe- und Ausstellungs-GmbH, 5 Cologne 21, Postfach 210 760 Frequency: Annual	February 3-7	February
INTERNATIONAL TRADE FAIR FOR THE HOTEL, CATERING AND BAKERY TRADES Location: Hamburg Sponsor: Hamburg Messe- und Congress-GmbH, 2 Hamburg 36, Jungiusstrasse 18 Frequency: Annual	March 14-19	March 19-24

EVENTS	1975	1976
HANOVER TRADE FAIR Location: Hanover Messegelande, Hanover Sponsor: Deusche Messe- und Ausstellungs-AG, 3 Hanover Frequency: Annual	April	April
REGIONAL MEAT TRADE EXHIBITION Location: Mannheim Sponsor: Mannheimer Ausstellungsgessellschaft mbH and Co. KG, 68 Mannheim, Theodor-Heuss-Anlage 38 Frequency: Annual	April 26-May 6	April 24-May 5
ANUGA—WORLD'S FAIR OF FOODS Location: Cologne Sponsor: Messe- und Ausstellungs-GmbH, 5 Cologne 21, Postfach 210 760	September 13-18	
HOTEL, CATERING AND CONFECTIONERY EXHIBITION Location: Saarbrucken Messegelande, Saarbrucken Sponsor: Saarmesse GmbH, 66 Saarbrucken	October 8-14	
INTERGASTRA '76—INTERNATIONAL HOTEL, CATERING AND CONFECTIONERS TRADE EXHIBITION Location: Stuttgart Sponsor: Stuttgarter Ausstellungs-GmbH, 7 Stuttgart 1, Postfach 990, Am Kochenhof 16		April 1-8
FOURTH INTERNATIONAL DLG DAIRY ENGINEERING TECHNIQUES EXHIBITION Location: Messegelande, Frankfurt Sponsor: Deutsche Landwirtschafts-Gesellschaft (DLG), 6 Frankfurt, Zimmerweg 16 Frequency: Biennial		October 12-16

IRAN

EVENTS	1975	1976
TEHRAN INTERNATIONAL TRADE FAIR Location: Tehran International Fair Grounds, Tehran Sponsor: Iran International Fairs and Exhibitions Corp., P.O. Box 33-32, Tehran Frequency: Annual	September	September
AGWA-FOOD Location: Tehran International Fair Grounds, Tehran Sponsor: Iran International Fairs and Exhibitions Corp., P.O. Box 33-32, Tehran Contact: Calvin and Tubiana, Inc., 500 Fifth Ave., N.Y. 10036	October 31-November 6	
PROTEIN PRODUCTION EQUIPMENT TRADE CENTER EXHIBITION Location: U.S. Trade Center, Tehran Sponsor: U.S. Department of Commerce		May

EVENTS	1975	1976
FOOD PROCESSING AND PACKAGING EQUIPMENT TRADE CENTER EXHIBITION Location: U.S. Trade Center, Tehran Sponsor: U.S. Department of Commerce		June 8-12
IRAN PAK Location: Tehran International Fair Grounds, Tehran Sponsor: Iran International Fairs and Exhibitions Corp., P.O. Box 33-32, Tehran Contact: Cavin and Tubiana, Inc., 500 Fifth Avenue, New York 10036 Frequency: Biennial		June 23-28
IRELAND		
IFDEX—INTERNATIONAL FOOD, DRINK AND EQUIPMENT EXHIBITION Location: Dublin Sponsor: John Palmer (Exhibitions) Ltd., 1 Seafield Close, Blackrock, Dublin	September 7-11	
ISRAEL		
ISPACK—INTERNATIONAL EXHIBITION OF PACKAGING MACHINERY AND MATERIALS AND FOOD PROCESSING EQUIPMENT Location: Yerid Hamizrakh Exhibition Gardens, Tel Aviv Sponsor: Yerid Hamizrakh Ltd., Yerid Hamizrakh Exhibition Gardens, Tel Aviv, and Israel Packaging Institute		May
ITALY		
INTERNATIONAL EXHIBITION OF PRESERVED FOOD INDUSTRIES Location: Fair Grounds, Parma Sponsor: E. A. Mostra della Conserve Alimentari, P.O. Box 31, Parco Ducale, 43100 Parma Frequency: Biennial	September	
EUROCARNE—INTERNATIONAL EXHIBIT OF TECHNOLOGY FOR THE CLEANING, PROCESSING AND MARKETING OF MEAT Location: Verona Fair Grounds, Verona Sponsor: Fiera di Verona, C.P. 525, 1-37100 Verona Frequency: Annual	October 2-6	October
SIMEI—INTERNATIONAL WINE-MAKING AND BOTTLING EQUIPMENT FAIR Location: Milan Fair Grounds, Milan Sponsor: Unione Italiana Vini e Centro Tecnico dell'Imbottigliamento, Via S. Vittore al Teatro 3, 1-20123 Milan Frequency: Biennial	November 16-23	
IPACK-IMA—NATIONAL PACKAGING FAIR Location: Milan Fair Grounds, Milan Sponsor: Instituto Italiana dell'Imballaggio, Piazza Eremitani 8, 35110 Padova Contact: IPACK-IMA, Via C. Ravizza 62, 20149 Milan Frequency: Biennial		February 16-22

EVENTS	1975	1976
JAPAN		
OSAKA PACK '75 and '76—OSAKA INTERNATIONAL PACKAGING EXHIBITION Location: Osaka Sponsor: Japan Packaging Institute, Kansai Branch, 58, Hashizume-cho, Honmachi, Higashi-ku, Osaka Frequency: Annual	February 20-22	February
CANNING ENGINEERING ASSEMBLY Location: Tokyo Contact: Canners Association, Japan, 4-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo	Spring	Spring
MEAT PROCESSING MACHINE SHOW Location: Tokyo (1975), Osaka (1976) Contact: Shokuniku Tsushinsha 2-10-11, Uchi Kanda, Chiyoda-ku, Tokyo 101 Frequency: Annual	April	April
EIGHTEENTH and NINETEENTH JAPAN NEW PACK—NAGOYA Location: Nagoya Fukiage Hall, Nagoya Sponsor: Nippo Co. Ltd., 4-4-5 Iidabashi Chiyoda-ku, Tokyo Frequency: Annual	April 10-13	April
MEAT INDUSTRY SUPPLY EXHIBITION Location: Oroshiuri Center, Tokyo Sponsor: Meat Industry Journal, 2-10-11 Uchi-kanda Chiyoda-ku, Tokyo Frequency: Semi-annual	Spring, Fall	Spring, Fall
EIGHTEENTH and NINETEENTH JAPAN NEW PACK—OSAKA Location: Minato Fair Grounds, Osaka Sponsor: Nippo Co. Ltd., 4-4-5 Iidabashi Chiyoda-ku, Tokyo Frequency: Annual	May 20-24	May
THIRD and FOURTH INTERNATIONAL FROZEN FOOD INDUSTRIAL GROUP EXHIBITION Location: Tokyo International Trade Fair Grounds, Tokyo Sponsor: Japan Management Association, 3-1-22 Shiba Koen, Minato-ku, Tokyo Frequency: Annual	June 3-7	June
JAPAN PACK '75 Location: Osaka Sponsor: Japan Packaging Machinery Manufacturers' Association, Daini Nanoh Building, 2-20-1 Nishi-Shimbashi, Minato-ku, Tokyo 105 Frequency: Biennial	September 19-22	
JAPAN FOOD INDUSTRY EXPOSITION '76 Location: Tokyo Sponsor: Japan Food Machinery Manufacturers' Association, Tabakosenta Building, 2-16-2 Nishi-Shimbashi, Minato-ku, Tokyo 105		Spring/ Summer

EVENTS	1975	1976
TOKYO PACK '76 Location: Tokyo Sponsor: Japan Packaging Machinery Manufacturers' Association, Daini Nanoh Building, 2-20-1 Nishi-Shimbashi, Minato-ku, Tokyo 105, and Japan Packaging Institute Frequency: Biennial		September
MEXICO		
PACKAGING EQUIPMENT TRADE CENTER EXHIBITION Location: U.S. Trade Center, Mexico City Sponsor: U.S. Department of Commerce		April 5-9
NETHERLANDS		
CONFECTIONERY FAIR OF UTRECHT Location: Koninklijke Nederlandse Jaarbeurs, Utrecht Sponsor: Koninklijke Nederlandse Jaarbeurs, Jaarbeursplein, Utrecht Frequency: Annual	March-April	March-April
MACHEVO—INTERNATIONAL EXHIBITION OF MACHINERY AND EQUIPMENT FOR THE CHEMICAL, FOODSTUFFS, FOOD, DAIRY AND DRINK INDUSTRIES Location: Koninklijke Nederlandse Jaarbeurs, Utrecht Sponsor: Koninklijke Nederlandse Jaarbeurs, Jaarbeursplein, Utrecht Frequency: Quadrennial	October 20-25	
MACROPAK Location: Koninklijke Nederlandse Jaarbeurs, Utrecht Sponsor: Koninklijke Nederlandse Jaarbeurs, Jaarbeursplein, Utrecht Frequency: Triennial		May 10-15
SLAVATKO—INTERNATIONAL MEAT INDUSTRIES FAIR Location: Koninklijke Nederlandse Jaarbeurs, Utrecht Sponsor: Stichting Slavatko, P.O. Box 235, Nijmegen Frequency: Triennial		October/ November
NORWAY		
NOR-FISHING Location: Nidarhallen, Trondheim Sponsor: Directorship of Norwegian Fisheries, Raadstuplass 10, Bergen Contact: Norges Varemesse, Drammensveien 154, Oslo 2 Frequency: Biennial		August
SPAIN		
IBERO-AMERICAN GENERAL TRADE FAIR Location: Palacio Ferial, Seville Sponsor: Comisaria de Ferias, Minesterio de Comercio, Plaza de la Castellana, Madrid 1 Contact: Feria de Muestras Iberoamericana, Pabellon del Peru, Jardines de San Telmo, Seville Frequency: Annual	April	April

EVENTS	1975	1975
INTERNATIONAL GENERAL TRADE FAIR Location: Benimanet, Valencia Sponsor: Comisaria de Ferias, Minesterio de Comercio, Plaza de la Castellana, Madrid 1 Contact: Feria Muestrario Internacional, P.O. Box 476, Valencia Frequency: Annual	May	May
FOIM—OFFICIAL AND INTERNATIONAL GENERAL TRADE FAIR Location: Palacio Ferial, Barcelona Sponsor: Feria Official e Internacional de Muestras, Avenida Maria Cristina s/n, Barcelona 4 Frequency: Annual	June	June
INTERNATIONAL GENERAL TRADE FAIR Location: Palacio Ferial, Bilbao Sponsor: Comisaria de Ferias, Minesterio de Comercio, Plaza de la Castellana, Madrid 1 Contact: Feria Internacional de Muestras, P.O. Box 468, Bilbao Frequency: Annual	June-July	June-July
INTERNATIONAL FOOD CANNING FAIR Location: Palacio Ferial, Murcia Sponsor: Comisaria de Ferias, Minesterio de Comercio, Plaza de la Castellana, Madrid 1 Contact: Feria Internacional de la Conserva y Alimentacion, Gran Via 11, Murcia Frequency: Annual	October	October
VIBEXPO—EXPOSITION OF WINES AND BEVERAGES Location: Palacio de Congresos y Exposiciones, Madrid Sponsor: VIBEXPO Executive Committee, and Instituto de Denominaciones de Origen Muesterio de Agricultura Frequency: Annual	November	November

SWEDEN

STOCKHOLM TECHNICAL FAIR Location: St. Erikshallen, Stockholm Sponsor: AB S:L Eriks-Massan, S-106 80 Stockholm Frequency: Annual	October 16-22	October 21-27
INTERFOOD '75—EXHIBITION OF FOOD TECHNOLOGY Location: Congress Centre, Gothenburg Contact: Svenska Massan Stiftelse, Skanegatan 26, S-41251 Gothenburg Frequency: Biennial	October 21-25	
SCANPACK—INTERNATIONAL PACKAGING FAIR Location: Congress Centre, Gothenburg Sponsor: Swedish Packaging Association Contact: Svenska Massan Stiftelse, Skanagatan 26, S-41251 Gothenburg Frequency: Triennial		October

EVENTS	1975	1976
THAILAND		
INTERNATIONAL CONFERENCE ON ASIAN FOOD STANDARDS Location: Bangkok Sponsor: United Nations Food and Agriculture Organization, 39 Phra-A-That Road, Bangkok	September	
UNITED KINGDOM		
FOODPACK INTERNATIONAL—INTERNATIONAL FOOD PROCESSING AND PACKAGING MACHINERY AND MATERIALS EXHIBITION Location: Olympia, London Contact: B.P.S. Exhibitions Ltd., 4 Seaford Court, 220-222 Great Portland Street, London WIH-5HH Frequency: Biennial	September/ October	
ICE CREAM ALLIANCE AND TRADE EXHIBITION Location: Metropole Exhibition Hall, Brighton Sponsor: Ice Cream Alliance Ltd., 90-94 Gray's Inn Road, Holborn, London WC1X 8AH	October 21-23	
INTERBAKE—INTERNATIONAL BAKERS' AND CONFECTIONERS' EXHIBITION Location: Olympia, London Sponsor: Bakery Equipment Manufacturers' Association, and National Association of Master Bakers, Confectioners and Caterers Contact: Industrial and Trade Fairs Ltd., Radcliff House, Blenheim Court, Solihull B91 2BG Frequency: Quadrennial	October 21-26	
BREWEX—INTERNATIONAL BREWING, BOTTLING AND ALLIED TRADES EXHIBITION Location: Earls Court, London Sponsor: Allied Brewing Trades Association, National Association of Soft Drink Manufacturers, and Process Plant Association Contact: Industrial and Trade Fairs Ltd., Radcliff House, Blenheim Court, Solihull B91 2BG		March 29-April 2
LONDON MEAT TRADES FAIR Location: Old Horticultural Hall, London Sponsor: Brintex Exhibitions Ltd., 178-202 Great Portland Street, London W1N 6NH Frequency: Biennial		May 16-19
U.S.S.R.		
INRYBFROM '75 — SECOND INTERNATIONAL EXHIBITION OF MODERN MACHINERY AND EQUIPMENT FOR FISH AND SEA PRODUCTS CATCHING AND PROCESSING Location: Leningrad Sponsor: U.S.S.R. Chamber of Commerce and Industry Contact: Directorate of International and Foreign Exhibitions, 1-a Sokolnichesky val, Moscow 107232	August 6-20	

EVENTS	1975	1976
EXHIBITION OF EQUIPMENT FOR INDUSTRIAL PRODUCTION OF MIXED FEEDS AND FOR PROCESSING OF SECONDARY RAW MATERIALS INTO ANIMAL FEEDS Location: Minsk Sponsor: U.S.S.R. Chamber of Commerce and Industry Contact: Directorate of International and Foreign Exhibitions, 1-a Sokolnichesky val, Moscow 107232		May 27-June 6
EXHIBITION OF MACHINES, EQUIPMENT AND INSTRUMENTS FOR THE MECHANIZATION OF GROWING, HARVESTING AND PROCESSING POTATOES Location: Minsk Sponsor: U.S.S.R. Chamber of Commerce and Industry Contact: Directorate of International and Foreign Exhibitions, 1-a Sokolnichesky val, Moscow 107232		July 29-August 8
EXHIBITION OF EQUIPMENT FOR GROWING, HARVESTING AND PROCESSING BLACK AND GREEN REGULAR TEA AND INSTANT TEA Location: Tbilisi Sponsor: U.S.S.R. Chamber of Commerce and Industry Contact: Directorate of International and Foreign Exhibitions, 1-a Sokolnichesky val, Moscow 107232		September 30-October 10
EXHIBITION OF MODERN MACHINERY, EQUIPMENT AND INSTRUMENTS FOR THE FOOD, CANNING AND WINE-MAKING INDUSTRIES Location: Baka Sponsor: U.S.S.R. Chamber of Commerce and Industry Contact: Directorate of International and Foreign Exhibitions, 1-a Sokolnichesky val, Moscow 107232		October 14-24

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